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ON

THE FUNCTIONAL ANATOMY OF THE HEART.*

BY

ARTHUR KEITH, M.D., F.R.S.,

CONSERVATOR OF THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ABOUT the middle of last century, when physiologists broke away from anatomists, they stole our patron saint—Harvey. Yet Harvey was an anatomist; from 1615, when he was 37 years of age, until 1656, when he was 78, he was the leading lecturer on anatomy in London. It was the application of a right method to the study of the structure of the human body which led him to see that the heart was a double pump forcing the blood to circulate throughout the body.

To understand how Harvey became an anatomist we must follow him to the University of Padua in the last year of the sixteenth century,[1] when he was in his twenty-second year. It was a fortunate circumstance for Harvey that Fabricius, Professor of Anatomy at Padua, was then reinvestigating the occurrence and use of valves in veins. He explained to his students that valves did not occur in arteries because in them the blood ebbed and flowed; but they were absolutely essential for veins in order that the venous blood, which was designed for the nourishment of the tissues, might be evenly distributed to all parts of the body. Were the veins of the arms and legs destitute of valves, it was quite clear, he maintained, that blood would gravitate to the hands and feet and so rob other parts of the body of their just share. We see, then, that Fabricius was studying the anatomy of the various parts of the human body in order to find out the purpose which they served; he was a functional anatomist. We may smile at his conclusions, but we could not make a greater mistake than to condemn his methods, for it was by following Fabricius's example that Harvey was led to his great discovery.

We have no exact information relating to Harvey's investigations between the time of his return to England in 1602 and his appointment as Lumleian lecturer at the College of Physicians in 1615. During those thirteen years he dissected many kinds of animals,[2] for Harvey was not only a functional anatomist, but a comparative anatomist and embryologist as well. We have only to turn to his introduction to his book on the motion of the heart and blood in animals to discover the manner in which he proceeded to work. He used anatomy as a touchstone on which to test the physiological theories of his day—the theories which Fabricius could expound so convincingly to his students. It was impossible to gainsay the then dominant theory relating to the use of veins. From an anatomical point of view the theory was apparently sound. The products of digestion certainly passed into the radicles of the portal vein and were "concocted" in the liver before being passed into the systemic venous system. The theory explained the existence of the liver and the distribution of veins to the most distant parts of the body. Fabricius had given the reason for the presence of valves in veins—except those in the jugular veins at the root of the neck. Harvey was quick to note that they pointed the wrong way, if Fabricius's theory were true. His real difficulties began when he sought to explain the parts connected with the right side of the heart. The blood entered that side of the heart, so he had been taught, for two reasons: (1) To supply the lungs with nourishment; (2) to send a supply to the left ventricle through the interventricular septum. "Why, then," asked Harvey, "is the vein which carries the blood from the right ventricle to the lungs given the coats of an artery and made as large as the aorta which has to supply 'vital' blood to the whole body?"

To men of Harvey's time the explanation of air passages to the lungs and of venous passages leading from the lungs to the left chambers of the heart were perfectly satisfying. They were the means by which air reached the left ventricle of the heart. In that chamber the air mixed with the transuded venous blood, and so vital blood was brewed—the blood which gave life and heat to all parts of the body. That the heart was the centre of life and heat had been proved beyond all dispute. Cut out the heart of an animal, and what happens? It died and turned cold; that was plain proof of the truth of the thesis. That air was necessary for the brewing of vital spirits in the left ventricle was a matter of common knowledge. Occlude the windpipe and an animal died, because the element necessary for the manufacture of "vital spirits" no longer reached the left ventricle. The left ventricle and arteries were clearly designed for the distribution of life-giving blood to all parts of the body. The heart could be felt to expand and suck the blood in, and then in turn the arteries could be felt to swell and suck the blood out. The blood ebbed and flowed in the arterial channels. It was a law of nature to ebb and flow. The sea ebbed and flowed; so did the breath.

To this physiological theory Harvey applied the critical judgement of the anatomist. No theory of the function of an organ could be true that did not explain every detail of its structure. To trace the direction of the blood current he took the valves as his guide. The venous valves pointed in every case towards the heart. The valves in the right side of the heart directed him towards the lungs; the valves on the left side of the heart directed him away from the lungs and towards the arteries. There was only one theory which accounts for all of those facts—namely, that the heart acted as a "water-bellows," a double pump, and in order that it could so act he had to presume that the blood moved in a circle. Such a theory of the heart gave a complete and absolutely satisfying explanation of all points in its structure; Harvey could conceive no other theory that would account for all the details of the heart's structure.

Harvey's theory was originally an anatomical hypothesis, but being a man who knew how deceitful hypotheses may prove to be, he put it to the test of experiment. He examined the movements of the living heart; he tested the flow of blood in arteries; he noted the flow of blood in veins. He found the flow to be such as his anatomical reasonings had led him to expect. But to the day of his death his conception of a blood circulation was still a theory; three years after his death in 1657, Malpighi saw with his eye those passages which lead from arteries to veins—passages which Harvey had pictured only in the eye of his imagination.

It might be said that the anatomical methods applied by Harvey at the commencement of the seventeenth century are not applicable to the conditions which prevail at the beginning of the twentieth century. I will give an example to show that they are—that they will be applicable as a basal principle in biological research for all time. Soon after the introduction of Roentgen rays in 1895 I used the method of transillumination to study the action of the crura of the diaphragm. I could not see how it was possible for the crural parts of the diaphragm to contract without acting directly on the heart and roots of the lungs, because the pericardium links the middle part of the diaphragm to both of these structures. I found that it did act directly on them. In the course of my investigations I was led to study the exact attachment of the musculature of the auricles to the pericardium, and thus indirectly to the diaphragm. That led me on to investigate other points in the musculature of the heart. In the course of these investigations I had noted the fine tendon-like structures in the left and also in the right ventricle. I never investigated them; I supposed them to be, as other anatomists had supposed them to be, means for preventing over-dilatation of the ventricles.

In 1906 Tawara, a Japanese, working in the laboratory of Professor Aschoff, discovered that these tendon-like structures were the arborescences of a muscular trunk which commenced in the region of the auricles and descended on each side of the interventricular septum towards the apex of the heart. Tawara explained the presence of the bundle and its branches by supposing that they formed a system for conducting and distributing impulses from the auricles to the ventricles of the heart. Erlanger and others proved by experiment that his guess was right. Tawara noted that the bundle at its

* Delivered before the Harveian Society of London, March 21st, 1918.

commencement in the auricle was made up of a peculiar muscular (nodal) tissue, in which he supposed the inception of the contractile impulse took place. In the following year Major Martin Flack and I, while investigating hearts on which Sir James Mackenzie had made his classical polygraphic records, discovered tissue of a nodal nature at the junction of the right auricle and superior vena cava. We supposed, because of its position and structure, that this node was the centre at which the heart-beat commenced. In 1910 Dr. Thomas Lewis and Dr. Wybau proved by electrical means, and independently of each other, that our guess was right. You can see that Tawara, Flack and I were applying Harvey's anatomical methods; Erlanger, Lewis, and Wybau applied his experimental methods. Harvey realized more fully than any anatomist that structure is a sure guide to function; that no physiological theory can be true unless it gives a complete and final explanation of all points of structure.

Taking Harvey as our guide, then, let us see how far our modern functional conception of the heart falls short of giving a full and satisfactory explanation of its structural features. We shall take the apical region first. Why are the ventricles of the mammalian and avian heart shaped like a cone? Why is it that the wall of the ventricles in the region of the apex is so thin that even in a cart-horse it is only 2 mm. in thickness, while the rest of the ventricular wall ranges from 10 mm. to 25 mm. in thickness? Why do the spiral fibres of the ventricles form the well known apical vortex? Why do the main arborescences of the A.V. bundle terminate in the apical region so that, as Dr. Thomas Lewis has demonstrated, the contraction wave is first manifested there? The arrangement of the musculature of the heart, both of auricles and of ventricles, is so complex that not any one of us has succeeded in giving a satisfactory explanation, yet we cannot claim to have mastered the mechanism of the human heart until we can give a functional explanation of its architecture.

In searching for an answer to some of the questions I have placed before you, we have to remember that the heart is a pump of a peculiar kind. In all forms of pump invented by man only one part of the wall is movable (the piston), and it is moved by a power which lies outside the pump. In the cardiac pump the whole wall is movable and the power is resident in every part of the pump wall. The expelling energy is manufactured in the wall of the pump—not in an adjacent boiler. Further, we must remember that the human heart is made up of a central or principal pump—the left ventricle, to which is attached three subsidiary pumps—the right ventricle for the maintenance of a pulmonary circulation, and the right and left auricles—loading pumps for the right and left ventricles. I brush aside a theory which is prevalent at the present time, a theory that defines the auricles as mere reservoirs. No one who has given attention to the elaborate architecture of the auricular musculature can countenance such a theory.[3]

As practical engineers we must look into the manner in which the cardiac pump is fixed. Each chamber of the heart must have its fulcrum—the point from which its musculature obtains a fixed point—before it can exert its power. The auricular pumps are fixed to the dorsal wall of the pericardium, and through extensions of that sac, and by means of the pulmonary vessels and the lungs, they are fixed to the walls of the thoracic cavity—both costal and diaphragmatic. When we open the thorax we at once undo the fixation of the auricles. Professor Berry Haycraft[4] was, I believe, the first to recognize that fact. There are two points of fixation—two fulcra—from which the musculature of the ventricular pumps act. There is, in the first place, the ascending aortic stem fixed within the cupolar part of the pericardium and the extensions of that membrane to the neck and to the roots of the lungs. There is, in the second place, the apex of the heart itself. By a most cunning mechanism—one of the most marvellous in the body—nature has converted the apical region of the heart into a movable fulcrum from which its ventricular musculature can and does act. In lower vertebrates, such as the tortoise, the mechanism of apical fixation is supplied by a ligament which anchors the blunt curvature of the ventricular chamber to the pericardial sac.

We have been discussing the fixation of the complex four-chambered cardiac pump; we must now look into a more important matter—the manner in which the ventricular chambers of the heart are fixed. For that purpose we must appeal to comparative anatomy and embryology for help. From these sources we learn that the primitive tubular heart undergoes an extraordinary transformation in the human embryo—a transformation not unlike that which takes place in the stomach. In the stomach one border undergoes a rapid and extensive development to form the greater curvature, while the other is retarded in growth and becomes the lesser curvature. In some animals the lesser curvature is so short, so suppressed, that the oesophageal and pyloric orifices are almost in contact. In the ventricular part of the cardiac tube the lesser curvature undergoes so great a degree of retrograde development that the auricular or proximal orifice comes to be situated side by side with the aortic or distal orifice, with only the anterior cusp of the mitral valve between them. The greater curvature has grown out as evaginations to form the ventricular chambers, leaving an untouched part between them to form a septum. The beginning and end of the ventricular tube have come to rest side by side on the lesser curvature, and form what we call the "base" of the ventricles.

It is quite clear that the anterior cusp of the mitral is a most important landmark on the ventricular base; it separates the auricular commencement from the aortic termination of the ventricular tube. The distinction between auricular and aortic bases is one of the utmost practical importance. When the ventricles contract it is the auricular base, surrounding the mitral and tricuspid valves, which becomes greatly reduced in size; the aortic base is, from a functional point of view, scarcely altered. When the ventricles contract the aortic base becomes a fulcrum from which the expelling musculature acts, while the auricular base descends towards the apex,[5] drawn by a musculature which acts from the apical fulcrum. The auricular and aortic bases are contrasted in both a morphological and a physiological sense. The descent of the auricular base necessarily enlarges the auricles; the movements of the auricular part of the ventricular base provide a key to the venous pulse. They do more than that, they give us a clue to the muscular architecture of the ventricles.

The complex architecture of the ventricular musculature was, in Harvey's time, a well-worn theme. A century and a half after Harvey, Hunter dismissed the matter by saying: "Much more pains than were necessary have been taken to dissect and describe the course and arrangement of the muscular fibres of the heart." The principle, however, which Hunter steadfastly applied to the elucidation of muscular action does prove of the utmost assistance. For Hunter it was a law that no muscle acted alone; every muscle acted in co-operation with an antagonist. His supreme example was the circular muscular coat of an artery. In the bowel the circular fibres have longitudinal fibres as their antagonists, for the effect of contraction in a circular muscular coat is to diminish the calibre of a tube, and at the same time to increase its length. Hunter saw that arteries were elongated by the contraction of their muscular coat, and regained their normal length by the contraction of their elastic coat, the muscular and elastic coats being antagonistic.

When we apply Hunter's principle to the study of the muscular coats of the left ventricle we see that we have to deal with a co-ordinated antagonism between a very massive circular "expelling" coat set between an outer and inner spiral coat. That principle will not help us unless we also recognize the two fulcra or fixed points of the left ventricle—the aortic fulcrum and the apical fulcrum. The fixed axis of the left ventricle passes from the mouth of the aorta to the apex; all the muscular fibres of the left ventricle are so set that in contraction they approach that axis. Besides the principle of antagonism and of fulcra, there is a third principle involved in the architecture of the ventricular musculature. The principle of the iris diaphragm is utilized. All the muscular coats or fasciculi of the heart are so set that they ultimately end in the internal spiral coat of the left ventricle, just as every segment of an iris diaphragm takes a share in forming the margin of its pupil. Without doubt the left ventricle represents one of nature's greatest mechanical triumphs.[6]

When we apply the principles just enunciated to elucidate the muscular architecture of the heart we are at once

impressed by the functional importance of the region of the apex. The chief terminal arborescences of the A.V. bundle end in the trabecular network of the apical region. Dr. Thomas Lewis[7] has demonstrated that the apical region is the first to pass into contraction with the onset of ventricular systole. When we open the ventricles we see that their internal musculature—columnae carneae and musculi papillares—commence in the apical region and divide into two sets. The larger set terminates in the auricular or movable base, the smaller or septal set in the fixed or aortic base. When we examine the outside of the ventricles we find the same arrangement in the spiral fibres. They commence in the vortex of the apex and divide into two sets—an extensive one which ends in the auricular movable base, and a less extensive, which ends in the fixed aortic base. Between these outer and inner sets is placed the great middle driving muscle of the left ventricle; its spirals are so closely pressed together that they give the appearance of being purely circular; we may speak of them as the circular set. The circular musculature, acting by itself, would diminish the circumference and at the same time lengthen the lumen of the ventricle the elongation is antagonized by the internal and external apico-basal musculature. We know that, at least in the earlier phase of ventricular systole, the auricular base approaches the apex and therefore the circular fibres are more than antagonized; in the later stages of ventricular systole the opposite is the case; the circular fibres become dominant and press again on the auricle, raising the intra-auricular pressure. The apico-aortic fibres are purely sustaining in function; they neither shorten nor lengthen in systole.

In several respects the structure and mechanism of the right ventricle is peculiar. There is incorporated in the infundibulum of the right ventricle a chamber—the pylorus of the primitive cardiac tube—an element which has completely disappeared in the left ventricle. The pulmonary orifice does not serve as a fixed point for the ventricular musculature; the infundibular septal bands of the right ventricle act from the aortic base. Further, the right ventricle has only one wall—the lateral; its septal wall—the interventricular septum—is part of the left ventricle; it takes only a passive share in expelling blood from the right ventricle. On the other hand, the right ventricle is provided with a highly developed internal musculature passing from its apex to the auricular base. The systolic movement of that base is more marked on the right side than on the left side of the heart. Hence we find in the lateral wall of the right auricle a well-developed opponent set of muscles—the musculi pectinati. In auriclar systole the musculi pectinati elongate the apico-basal fibres of the right ventricle; in ventricular systole the opposite occurs.

I noted, when investigating those hearts in which Sir James Mackenzie first observed that the auricles had ceased to functionate—from auricular fibrillation, as was afterwards proved—that a condition was present similar to that which occurs in a limb when a set of muscles undergoes contracture from paralysis of the opponent group. In such cases the lateral wall of the right auricle had become elongated and stretched, while in their opponents—the apico-basal fibres of the right ventricle—an extreme degree of shortening had occurred.

I have merely touched on some of the unsolved problems relating to the structure and mechanism of the heart. I am content if I have succeeded in showing that Harvey's methods of investigating anatomical problems are still the best that we anatomists can adopt.

REFERENCES.

[1] Sir Thomas Barlow, BRITISH MEDICAL JOURNAL, 1916, ii, p. 577. [2] See D'Arcy Power's *William Harvey*, in the Masters of Medicine series, 1897. [3] See Proceedings of the Anatomical Society of Great Britain and Ireland, November, 1902 (appended to *Journal of Anatomy and Physiology*). [4] *Journ. of Physiol.*, 1891, vol. xii, p. 438. [5] See Chauveau and Marey, *Mém. de l'Acad. de Médecine*, 1863, vol. xxvi, p. 313; Haycraft, *Journ. of Physiol.*, 1891, vol. xii, p. 438. [6] The best account of the arrangement of the muscular fibres of the heart is that given by the late Professor Bell Pettigrew (*Phil. Trans.*, 1864, p. 445). The late Dr. John Bruce MacCallum also gave an excellent account in *Johns Hopkins Hospital Reports*, 1900, vol. ix, p. 307, Professor Franklin Mall added very important embryological facts (*American Journ. of Anatomy*, 1912, vol. xiii, p. 249). For an introduction to the older literature see the chapter on the heart in Poirier's *Traité d'anatomie humaine*, 1899, and Quain's *Elements of Anatomy*, 1892. My statements are based on dissections carried out between 1901 and 1907, and will be published in full at some future date. [7] Croonian Lecture, *Proc. Roy. Soc.*, 1917, S. B, vol. lxxxix, p. 560; *Lectures on the Heart*, 1916.

THE TOLERANCE OF PHYSICAL EXERTION, AS SHOWN BY SOLDIERS SUFFERING FROM SO-CALLED "IRRITABLE HEART."

By THOMAS LEWIS, M.D., F.R.S., F.R.C.P., D.Sc.,

PHYSICIAN OF THE STAFF OF THE MEDICAL RESEARCH COMMITTEE; ASSISTANT PHYSICIAN, UNIVERSITY COLLEGE HOSPITAL.

(From the Military Heart Hospital, Colchester.)

IT is now two years since we introduced at the Military Heart Hospital, Hampstead, a system of graded drills, arranged from exercises in the army exercise book, and employed these both remedially and as means of grading soldiers returned to us for the condition known as "disorderly action of the heart," "irritable heart," etc. We have repeatedly contended that the surest means of gauging capacity for physical endurance is to test the men upon drill, the highest grades of which should approach in their severity the tasks which will be set to these men when they return to their dépôts. The test of capacity for work should be the observed reaction to work. That this thesis has been justified fully is shown clearly in an article published recently elsewhere,[1] in which the after-histories of 239 graded out to duty categories by this system are compared with the recommended categories of discharge. This comparison is reviewed in the subjoined table:

Recommendations.		*Disposition within 11 Months.*	
Fit for general service	72	Full duty overseas, 79:	
		Known to reach firing line (of whom 26 make good)	35
		Not known if in firing line	23
		Known not to have been in firing line	21
Likely to be fit for general service within 3 months	47	In provisional units	30
		Full duty home service ...	8
Light duty; unlikely to be fit for overseas within 3 months	20	Light duty overseas	7
		Labour companies (H.S.) ...	23
Light duty, but unlikely ever to be fit for service overseas	68	Light duty (H.S.)	33
		Sedentary duty	16
Sedentary work at home ...	32	Under treatment	5
		Discharged permanently unfit	38
	239		239

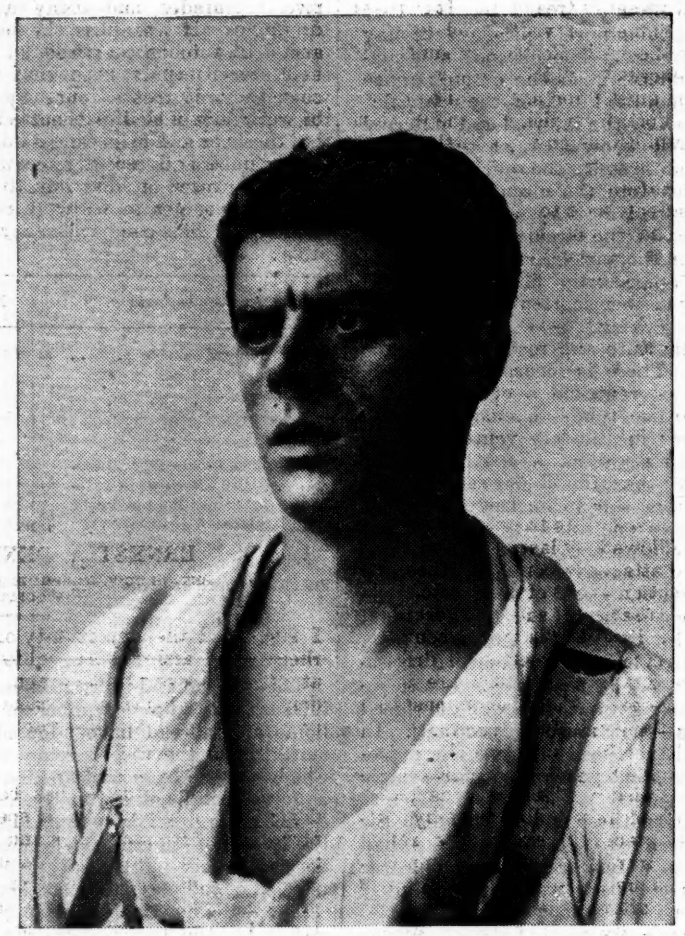
This system and its results have aroused a good deal of interest, and a large number of military hospitals both at home and abroad have adopted it; others are following suit. Since the recent removal of the heart hospital to Colchester we have continued to receive numerous inquiries as to the details of our method. In part these have been described in previous publications.[2] In the present article the work of the medical officer's examination room is described, his method of prescribing exercises, and his method of judging the toleration of exercises so prescribed.

The drills now in use are termed B 15, C 15, BC 30, C 30, and D 30,* the letter indicating the stiffness of the exercises, the number the duration of the drill in minutes. B 15 consists of simple movements, and calls for no considerable expenditure of energy; D 30 includes many of the stiffest exercises of the army exercise book, and entails thirty minutes' hard work.

Seeing that most of our patients are recently from France, all those cases to whom drills are prescribed start on the easiest drill, and progress from this to those of higher grades, according to tolerance. A few days or a week upon the two 15-minute drills suffices; a week is usually spent on each of the three 30-minute drills. Men who promise well may be kept a week or so longer on the highest grades of drill to harden them. It is a rule of the hospital that patients upon 15-minute drills are to be considered unfit to leave the hospital premises except under escort; those on 30-minute drills are given afternoon passes freely. This rule has the advantage of stimulating the men to accomplish the 30-minute drills. All men on exercise C 15 and BC 30 go regularly for route marches in the early afternoon; these are short marches of one or two miles in the immediate neighbourhood of the hospital, and at slow time. Men in classes C 30 and D 30 are taken for longer marches of four to five miles in the

* Two of our original drills, A 15 and AB 30, have been discarded.

country at a brisk pace. The exercises and marches are supplemented by outdoor games. At suitable intervals all men are examined as they come from drills or marches. It is understood that any man who feels his drill or march to be beyond his power is to report at once to his medical officer. The drill instructors are ordered to report upon men who seem to them to tolerate exercise badly, and, on the other hand, upon any men who fail to make reasonable effort. Co-operation between the medical officers and the instructors is a very essential feature of our system, and much is left to the instructor's discretion. It is the habit of most medical officers to see each man immediately after he has taken the first drill of each grade; other officers prefer to raise the grade more automatically, and to await complaints from such men as feel themselves hard pressed. At the examination, whether it be at the dictation of the medical officer or drill instructor, or at the wish of the man, questions of a general nature only are asked; the rule is to allow the man to tell his own story; it is inadvisable for the officer to introduce any symptom into the conversation. Notes are kept on simple forms provided for the purpose; each symptom complained of is entered, as are corroborative signs and readings of pulse-rate, etc. This sheet forms in the end a summarized history of the work accomplished and the reaction to it. In the average one or two examinations of each man are made weekly directly after exercise. Medical officers are careful to conceal so far as possible the particular symptoms or signs upon which they judge tolerance.



Photograph of a patient, aged 28, admitted for long-standing and severe "D.A.H." The photograph was taken immediately after fifteen minutes' easy exercises (B 15), and shows the tension of the sterno-mastoid, slightly opened mouth, and dilated nostrils. The eyebrows are depressed, the forehead furrowed (the central furrow is permanent). The face expresses fatigue and the anxiety of early breathlessness.

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A complaint of *fatigue* or *exhaustion* is rarely unaccompanied by other complaints, and may be disregarded unless often repeated and accompanied by signs, such as pallor, or by uncontrollable tremor of lips or limbs, or by signs of breathlessness, as the grade of exercise is raised. Stiffness of the limbs or trunk muscles, accompanied by tenderness, is experienced by some unpromising cases to an unusual degree as an after-effect of short exercise. Pain in the axillary region, back, or limbs is usually related to a particular action during drill, and as a general rule does not endure.

Simulation.

If it were wise it would be impossible to hide the meaning of the exercises or their use for sorting purposes from the patients, and they come to understand the significance of any deliberate special examination. We believe that complaints of distress, where absolutely no distress exists, are on the whole rare. Such complaints do not deceive; the manner of their presentation awakens doubt; they are unaccompanied by objective signs or the signs are incompatible with the complaint.

The over-emphasis of symptoms actually experienced is somewhat more difficult to recognize and is undoubtedly common; it is recognized by the same careful comparison of the objective and subjective. Medical officers will be well advised to guard against wilful efforts to produce or to exaggerate signs of distress. A man returning from exercise to the medical officer's room will from time to time sprint on the flat, dash upstairs, or perform vigorous exercises before opening the door and presenting his wrist for examination. But such attempts are not easy to maintain, and repetition is essential to their success. The man must repeatedly risk detection by a member of the staff, or, maybe, fails to find his opportunity; in the last case his observed reaction is out of harmony with former reactions. The genuineness of a sudden increase in the reaction to exercise is to be tested by visiting the man while he is at drill, or by imposing simple exercise tests in the examination room or ward. The constant supervision of drill by medical officers has been abandoned as both unnecessary and inexpedient; the men work better and more uniformly when left to the drill instructor. No doubt the voluntary production of distress is overlooked from time to time in individual cases, but it cannot long be concealed from the man's comrades, and many of these at once resent the deception. If less gross, the deception may be contagious, and comes to be practised by small groups of men; its early discovery is from that time certain. When discovered, it is met at once by placing the man upon a higher grade of drill without comment.

The other and brighter side of the picture is the man or men who steadily refuse to complain; these tax the medical officer's power of discrimination most of all. Medical officers who get to know their men, who can win their confidence, who treat them tactfully and fairly, experience little difficulty. By far the larger part of our patients desire only full examination and consideration, and recognize the justice of the final decision, understanding for themselves that they are judged for grade of service according to their proved tolerance for work.

REFERENCES.

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NOTES ON RHEUMATOID ARTHRITIS.*

BY

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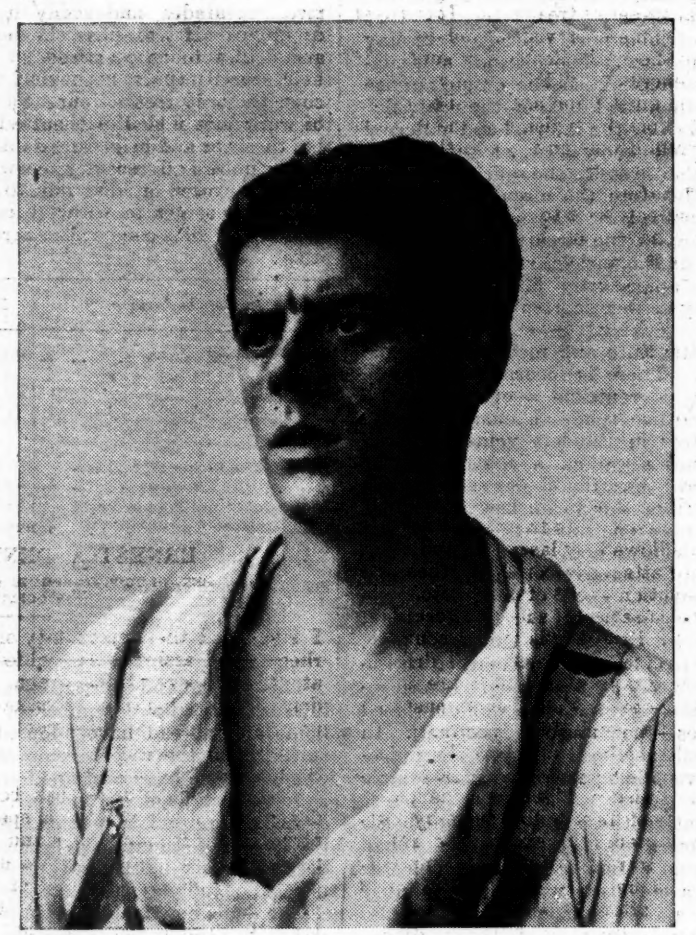

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genito-urinary tract; he has operated upon a great many cases of chronic arthritis deformans by opening up and draining the infected seminal vesicles, and although improvement after the operation may be delayed for several months, he says that the ultimate benefit has been, without exception, considerable. Symes considers that it is a disease derived from an intestinal cause, an auto-intoxication of unknown origin.

FIG. 1.—Acute case in a boy aged 14. During the first two weeks of treatment the temperature in the evening was usually between 101° and 103°, with morning falls to normal. All the joints more or less affected, and muscular wasting pronounced.

The general idea seems to be that several micro-organisms have the power of producing the characteristics of the disease; it is extremely probable that in many cases rheumatoid arthritis is an infective disease, and that it is due to micro-organisms settling in the joints or dwelling elsewhere, and elaborating toxins, which cause a progressive inflammatory condition.

Owing to the symmetrical nature of the affection, it was at one time believed to be of nervous origin, and it is likely that some cases are so.

DIAGNOSIS.

The affections for which this disease is most liable to be mistaken are rheumatism, gout, and sciatica. It is in the early and slowly progressive chronic cases in which there is not any very marked enlargement of bone apparent, and in subacute attacks, that the chief difficulty arises in distinguishing rheumatoid arthritis from rheumatism. The points which may serve as a guide to diagnosis are:

1. *From Rheumatism.*

(*a*) In the chronic form, invasion of the small joints first (notably the proximal phalangeal joints of the first and second fingers and the metacarpo-phalangeal joint of the first finger and thumb), fusiform swelling, symmetry of the affection, prevalence in women, affections of the temporo-maxillary articulation and those of the cervical spine, pain along the clavicle, crepitation or grating felt in the joints on movement, muscular atrophy (especially interossei), clamminess of extremities, tendency to spread from small to large joints, anaemia always present, family history of phthisis. Sometimes the first indications to the patient are numbness and tingling in the limbs.

(*b*) In subacute attacks it may be for the first few days impossible to decide. The small joints are attacked first, without any tendency to rapid migration; the swelling is circumscribed; the symptoms persist, although under treatment; there is little tendency to high temperature curve; there is very little (if any) tendency to endocarditis and pericarditis. Garrod went so far as to consider the absence of cardiac inflammation as one of the most important diagnostic features of rheumatoid arthritis, and said he had never traced either endocarditis or pericarditis in this disease.

2. *From Acute Gout.*

In gout there is a tendency to commence by sudden pain and swelling, especially of the great toes, with oedema and redness. Rheumatoid arthritis has an insidious onset; it is more common among the poor and ill nourished. Gout is comparatively rare in women: it may be more difficult to distinguish from chronic gout, but the history will help. The deformities of chronic gout may resemble to some extent those of advanced rheumatoid arthritis, but in gout definite attacks occur from time to time, and usually deposits of sodium urate will be found near the articulation or in other parts, such as the ears or hands. It occurs more frequently in men, and there is little or no tendency to emaciation. In rheumatoid arthritis the temporo-maxillary joint is often affected, and also the joints of the cervical vertebrae, as evidenced by pain and stiffness, and there is symmetrical involvement of the small joints of the hand. In gout these conditions are not present. It is of great importance to distinguish between the two conditions because the treatment is essentially different. A case of rheumatoid arthritis must not be subjected to a régime so necessary in certain forms of gout. There are some cases in which, I believe, the diseases coexist.

3. *From Sciatica.*

Where the hip-joint alone is affected there is often a resemblance in the symptoms to those of sciatica. A diagnosis can usually be made by careful examination of the part. In rheumatoid arthritis the affected leg cannot be crossed over the other without causing great pain. If the foot is jarred pain is felt in the joint. There may be considerable thickening, due to bony outgrowths, and grating may be felt on rotation. The general pain is referred more to the joint than to the region of the sciatic nerve and down the limb. Charcot's joint disease is thought by some to have the same pathology as rheumatoid arthritis, the suggestion being that the affection is rheumatoid arthritis occurring in a patient debilitated by the cord disease. There is in Charcot's disease no pain in the joint, although there is so much degenerative change that the functions are in abeyance. Monarticular rheumatoid arthritis, usually in one of the larger joints, may simulate a tuberculous affection, and the distinction is at times extremely difficult. The vertebral column is sometimes involved to such a degree that the pain and rigidity may lead to the belief that spinal caries is present, and great care is needed in distinguishing these affections.

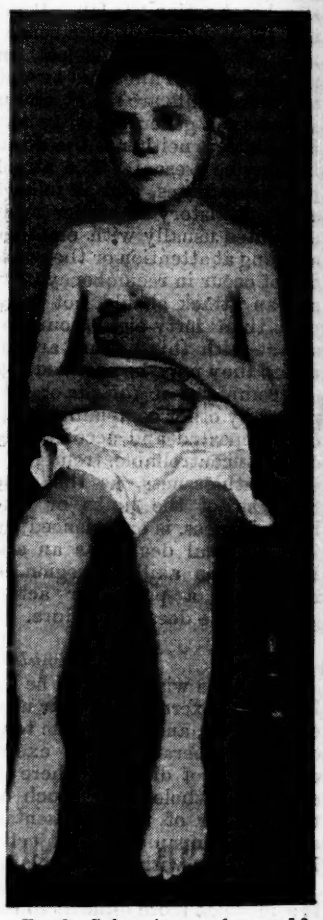

FIG. 2.—Subacute case: boy aged 8. Seven and a half months' duration.

Still's disease in children, which occurs mostly in young girls, closely resembles rheumatoid arthritis, and is, possibly, a modified form of the disease; its nature is uncertain. It differs from rheumatoid arthritis, however, in that the spleen is enlarged and also the liver. The lymphatic glands are increased in size, at first near the joints, and later throughout the body. There is defective development, the eyes may be prominent. It is usually a fatal disease, although it may last for years.

TREATMENT.

Although rheumatoid arthritis is a progressive disease, and by some considered incurable, much can be done in the early stages to arrest, and in the more advanced cases

to relieve. It is a disease which seems to attack a constitution debilitated from some cause, and it is of great importance, therefore, to refrain from any kind of lowering treatment, either in the acute or chronic forms. In acute and subacute cases the patient should be in bed, and an endeavour made to relieve pain by soothing applications, such as lint wrung out of lead and opium lotion. The joints should be kept at rest while acute symptoms last, but as soon as they subside gentle movement should be begun, as there is great tendency in this affection for the joints to become stiff. Splints, if used, should not be kept on continuously. The pain may sometimes be lessened by painting the joints with guaiacol and tincture of iodine in the proportion of 1 of guaiacol to 6 of iodine. Mesotan with olive oil, or a 25 to 50 per cent. ointment with lanoline, may be used. Methyl salicylate with three parts of olive oil, or with six parts of tincture of iodine, may be thickly painted over the painful articulation, which should then be covered with lint and oilsilk and lightly bandaged. I have known an icebag give relief when other methods had failed. In chronic cases there is perhaps no more generally useful application to affected joints than blisters, which seldom fail to relieve pain and stiffness so often complained of, and in no joint more successfully than the temporo-maxillary; they should be small, and may be repeated. Sometimes bathing with hot water does good. Midelton advocates the use of continuous counter irritation over the spinal cord, even in the most advanced cases where all treatment may appear to be hopeless, believing that nervous changes are an important factor. The principal methods he uses are (1) blisters followed by savin ointment; (2) acupuncture with counter-irritant drugs such as cantharides, croton oil, or oil of mustard; and (3) the galvano-cautery. When joints are more stiff than painful olive oil may be used for rubbing instead of liniments, especially in children, where weakness of joints is a symptom; or if there are soft swellings, adhesive strapping gives support and comfort and tends to reduce the swelling. Sometimes extension with weights is soothing and helps to counteract the tendency to flexion so often present; it is specially useful when the pain is severe, as is often the case in the knees, apparently from rubbing of the ulcerated cartilages one upon another; the weights should not be heavy and should be applied continuously. Fingers which are becoming flexed can be rendered considerably straighter by a suitable splint on the palmar aspect; this should be applied at night and taken off in the morning, so that the fingers may be moved during the day. Patients should be told to use their joints as much as they can short of giving rise to pain afterwards, also to take exercise in the open air. If the affection is in the joints of the lower limbs, walking is rendered less painful and difficult by the use of an apparatus so constructed with adjustable crutches on wheels that part of the weight of the patient can be transferred from the lower limbs to the axillae and arms. Adhesions are occasionally broken down under an anaesthetic, but the results I have seen have not been encouraging as most of the joints again became stiff (possibly in some cases owing to neglect by the patients themselves in after-treatment).

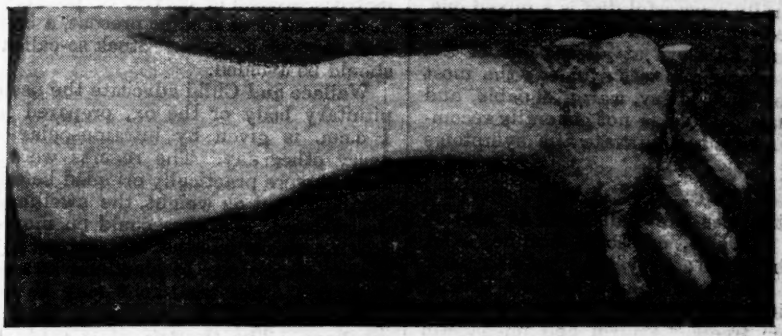

FIG. 3.—Chronic case; male. Dislocation, pigmentation, wasting, and deposits.

FIG. 4.—Chronic case: female, aged 45. Marked ulnar deviation, dislocation at metacarpo-phalangeal joints. Twenty-five years' duration.

FIG. 5.—Chronic case: male, aged 19. Seven years' duration.

FIG. 6.—Chronic case: female, aged 49. Interossei much wasted, and knuckles thickened. Five years' duration.

Excision, scraping of joint tissues, or merely washing out the joint, in the acute stages, have been tried with a view to arrest the spread of the disease; it is stated that by the removal of the diseased cartilage and synovial membrane of one joint, not only is that joint improved (if not cured) but the other affected joints are also improved.

Diet.

In acute cases the diet should be light, easily assimilated, and nourishing — milk, raw meat juice, broth, eggs, etc.— and increased to more solid food as the febrile symptoms subside; stimulants may be required. Chronic cases should not be on low diet; this, like phthisis, is a disease in which good feeding is essential. Attempts have been made to discover whether the nature of the food has any bearing upon the severity of the joint symptoms.

The conclusion is that diet has little relationship to the disease; no advantage is to be gained by excluding red meats from the diet; fruits and salads may be taken. Meals should be arranged at regular intervals and should be varied. No hard and fast rule can be laid down, and probably the most generally successful diet is a mixed one. Fats are needed, cod-liver oil, and also milk and cream.

Woollen clothes should be worn at all seasons of the year, and any exposure to cold and wet avoided; the most suitable climate is one which is dry, warm, equable, and sunny. Residence at the seaside is not generally recommended and sometimes seems to aggravate the symptoms of the disease.

Drugs.

In febrile cases antiseptics are indicated, as also in many chronic cases. Guaiacol, creosote, quinine, salol, or salicylates, should be given; they often relieve pain. Sodium salicylate is of most use when there is a history of rheumatism, and if combined with twice as much bicarbonate can be given freely. Aspirin and phenacetin often relieve the pain. Anaemia is always a symptom of the disease and requires treatment. Iron and arsenic are probably the most useful of all drugs for improving the general health. They are best given in combination; the syrup of the iodide of iron is one of the most suitable forms. Potassium iodide is often given for pain at night. For cramps, hyoscyamus or cimicifuga is worth trying. Morphine and opium should be avoided if possible. I have not found it necessary to prescribe either, and their routine use is to be deprecated.

Constipation, which is common, and other digestive troubles require attention. Sulphocarbolate of soda and the antiseptics already mentioned are serviceable. If the stomach is dilated it should be washed out. It is important to remedy any oral sepsis; the teeth must be attended to, but I strongly deprecate indiscriminate extraction. Antiseptic washes should be used freely. Paraldehyde, phenacetin, and bromide may be given for sleeplessness. Where gout is present colchicum and alkalis should be prescribed; an alkaline mixture of quinine is also of service.

The chief advantages claimed for treatment by passive congestion appear to be relief of pain, which is often very marked, and the prevention of stiffness. Pain gives rise to muscular spasm, and this causes stiffness. The relief of the pain by congestion enables the joint to be moved, and this counteracts the tendency to the formation of adhesions. It is also said to promote the resolution of thickening in joints and tendons.

Massage is of value for the relief of pain and in keeping up the nutrition of muscles; it also relieves or prevents stiffness and fixation of joints.

Electricity, in the chronic conditions where there is atrophy and debility and the disease is not in an active state, in the form of a weak continuous current, may be of service. I have used galvanism with some benefit to nutrition and lessening of pain. Electric baths are also useful in certain stages.

Heat almost always relieves pain, and the most efficacious form appears to be the dry radiant heat; the diaphoretic effects of the combination are greatly superior to those of the same degree of non-luminous heat, and the body can bear with this form much higher temperatures than by any other application; a whole body bath can be used at a temperature as high as 300° or 400° F.; with a local bath it may be raised to 500° F. Besides relief to pain, other important changes are effected. Free perspiration is induced over the whole body even although the rays are applied locally, local arterial pressure is diminished, and metabolic processes are increased. Light has the effect of tending to increase the haemoglobin and in this way the anaemia is benefited; the appetite is also improved. The effects of the baths are enhanced if they are followed by massage and the free use of iodex or some other ointment or application of the same kind; adhesions and muscular contractions around joints are softened and relaxed and can be more easily broken down, and in this way some of the most chronic forms can be relieved.

Vaccines have been used, and acute infective cases have been treated by hypodermic injections of antistreptococcic serum. Crowe has found much benefit from the use of vaccine prepared from the *Staphylococcus deformans* in acute rheumatoid arthritis, and in obscure neuritis where the micro-organism has been shown to be present in the patient's urine. It is at times very difficult to distinguish true rheumatoid arthritis from septic arthritis (gonorrhoea, pyorrhoea, etc.).

If a local suppurative active centre, such as endometritis, erosion of cervix, or possibly a similar condition in the nose or mouth, be present, a culture should be made and a vaccine given. Stock so-called rheumatic vaccines should be avoided.

Wallace and Child advocate the use of an extract of the pituitary body of the ox, prepared in a particular way; 1 c.cm. is given by intramuscular injection, generally every other day. The reports were that the patients so treated were practically crippled before the treatment was begun, all put on weight, the swellings around the joints disappeared, and they could be moved without pain after two or three months of treatment. Roberts also is in favour of the use of glandular extracts in chronic cases, whatever other treatment may be adopted at the same time; he uses, in particular, the thyroid, thymus, and pituitary. The thymus, it is said, acts very slowly, and should be continued for six months before it is given up; it is unsuitable if there has been a rapid increase of weight, because it sometimes stimulates nutrition to an unusual extent.

Baths have long been held in repute; they are chiefly indicated when the disease is in an early stage and the patient in fair general health; they are not advisable in the old or debilitated. The chemical properties of the water used is not a matter of vital importance, the chief point is the mode of application. The objects aimed at are: decrease of pain and stiffness in the joints, a general improvement in the patient's strength and nutrition, increased elimination by the skin, and absorption of the swelling around the joints. My experience convinces me that bathing, with its accompaniments, is a form of treatment which in suitable cases is of the utmost value, and there is not a doubt that, even in some of the most chronic and advanced cases, great relief or permanent benefit is a frequent result. The good effect is greatly enhanced by the internal administration of a mineral water properly prescribed, and although the use of any pure water may be of advantage, it is well known that if a water prepared according to the formula made out from the analysis of a mineral water be drunk, the effects are not at all the same as those obtained by drinking the original water in its natural state.

The advantages of a course at a mineral water spa do not consist only in the special medicinal virtues of the waters used but in the fact that the treatment is carried out with care and skill. The change of air, the modification of diet, and freedom from home cares and worries, are all important adjuncts, and patients should be recommended to visit year after year some health resort where such a régime can be provided. We have in Cheltenham the facilities necessary to carry out such treatment. Especially are we well off in regard to the mineral waters for internal administration, which have been shown by analysis to be superior to most and surpassed by none of their kind at any health resort either in England or abroad. Now is the time, when the foreign spas which have hitherto been so greatly in demand are closed, to make known in every legitimate way the many special advantages offered by our own town.

A great deal has already been accomplished, and efforts are still being made, to advertise the place and render it attractive and wholly efficient for the comfort and entertainment of patients and visitors. Much depends on the medical profession generally to help the undertaking by sending patients here to drink the waters and to undergo the usual courses of treatment which are expected at a spa, and which they can obtain in Cheltenham quite as well as they can at some of the health resorts which are much farther away.

THE Carnegie Foundation has given £200,000 to McGill University, Montreal, in recognition of that institution's "devoted service and sacrifice towards Canada's part in the war." The gift is intended as an expression of the appreciation and sympathy with the people of the Dominion felt by their allies in the United States. A part of the work which has earned this tribute is the maintenance of a general hospital in France with more than 2,000 beds.

AN ESSENTIAL PRINCIPLE IN THE TREATMENT OF GAS GANGRENE.

By Temporary Colonel H. M. W. GRAY, C.B., M.B.Aberd., F.R.C.S.Edin.,
Consultant Surgeon, British Expeditionary Force.

I wish to urge the wide recognition and application of a principle which I believe is essential for the successful prevention and eradication of gas gangrene in war wounds met with in France. My reason for doing so is that I have not seen it definitely mentioned in any writings in the public press. I have recommended it for the past two and a half years, and it becomes daily more evident that the principle is correct.

The causative bacilli of gas gangrene will not develop in tissues which are provided with a vigorous circulation of healthy blood. They thrive best when the circulation is entirely stopped—for example, in a person dead of gas gangrene or in a limb of a living person where the main vessels have been severed. Long application of a tourniquet often allows the infection to obtain a firm hold. Feebleness of circulation in the wounded part, whether from a general cause, such as shock, or from a local cause, such as tension from effused material or pressure of foreign bodies, favours its development. As Major-General Cuthbert Wallace and others have pointed out, these bacilli grow most luxuriantly in devitalized muscle. The injured muscle or group of muscles is deprived, in part or in whole, of its normal blood supply according to whether the missile severs the main nutrient vessels or merely causes isolation of lacerated portions. Pressure in the neighbouring parts, whether caused by effused material in the wound, by inflammatory reaction, or by external constriction, interferes still further with the circulation, and forms a most important arc of the ever-widening vicious circle of spreading inflammation.

From purely clinical observations, then, the principle has been evolved, and it is this: Whether one undertakes preventive, pre-inflammatory operation, or curative operation after the gangrene has developed, success and safety are assured only when the wounded parts are excised until *definite* bleeding of the cut surface is seen. The bleeding must be definite; it need not be free. In pre-inflammatory operations the use of a tourniquet during operation may be permissible; it is not advisable unless the patient is exsanguinate. In cases where gangrene is already well marked it should not be used. Care must be taken that in excising parts at the later stages of the operation the blood supply of tissues left behind at an earlier part of the operation is not interfered with; therefore, as a rule, proximal parts should be excised before distal parts. It is usually easy to decide, when this principle is kept in view, how much should be excised—whether only part of a muscle, the whole muscle, a group of muscles, or the limb.

Surgeons who base their work on this principle have more success, and have to perform fewer secondary operations than those who do not follow it.

On the successful application of the principle I have enunciated depends the justification of the practice of excision and primary suture of wounds—a procedure which I carried out with gratifying results as far back as November, 1914.[1]

Reference.
[1] British Medical Journal, August 28th, 1915.

A CASE OF PYAEMIA TREATED WITH INTRAVENOUS INJECTIONS OF EUSOL.

By ROBERT AITKEN, M.D., M.R.C.P.E.,
Temporary Surgeon R.N.

In my opinion there can be no doubt that the intravenous use of eusol saved the life of the patient whose case is here recorded. He was exceedingly ill on the Wednesday when he was admitted, and I did not expect that he would see the end of that week. It was very noticeable how he improved after each injection of eusol, and I have pleasure in adding my testimony as to the value of that remedy.

William C., aged 20, a gunner in the R.G.A., was admitted to the R.N. hospital ship *Plassy* on October 18th, 1916. Ten days earlier he had had tonsillitis which soon cleared up. Four days before admission he had become feverish again, and marked deafness was present in both ears.

His temperature was 103°, and he complained of pain in the left sterno-clavicular, left shoulder, left wrist, and right ankle joints; all of these were swollen and tender. He was very deaf. There was no pain or tenderness about the ears or mastoid region. The tonsils were slightly congested and enlarged, but he had no pain on swallowing. No other physical signs were made out.

The day after admission the joints were still very painful, and the patient was seriously ill. He was put on tincture of strophanthus and brandy, alternating every two hours. As he seemed to be suffering from a pyaemia he was given that evening an intravenous injection of eusol as recommended by Lorrain Smith[1] (80 c.cm.). The following morning his hearing had slightly improved, and he said that the pain in his joints was easier. Towards evening the pain got worse again, and I gave him another intravenous injection of 100 c.cm. of eusol. He had a fairly comfortable night, his temperature falling steadily for six hours after the injection to 100°, which was the lowest reached since admission. He complained, however, of pain over the right foot.

For the next three days he improved, requiring less assistance, and taking more notice of what was going on in the ward. As the right foot had become more painful and oedematous, an incision was made and the pus present evacuated, the wound being dressed with eusol. Staphylococci and a few streptococci were cultivated from the pus.

The temperature continued high, frequently being 103°, and on the evening of October 24th I gave him another 100 c.cm. of eusol intravenously. Half an hour later he had a rigor; the temperature rose to 105.8° and the pulse to 156. In two hours the temperature had fallen to 98.2° and the patient was feeling comfortable. The following morning there was a marked improvement. He could hear almost ordinary conversational tones from the other end of the bed. The temperature was 97°. The joints were no longer swollen and there was practically no pain or tenderness.

For the next few days he improved and was able to move himself without pain, but he was still very ill. The temperature had been remittent, but now became intermittent. In spite of the tendency of the temperature to fall, dullness began to be noticed on the left side of the chest, and its area increased. On October 30th his chest was aspirated and 105 fluid ounces of thin peasoup-like fluid drawn off; this contained both staphylococci and streptococci. He was so ill, however, that I did not consider it advisable that he should be operated on to establish free drainage.

From this time he improved more rapidly, but a few days later his temperature began to rise again and the fluid showed signs of reaccumulating. Accordingly, on November 8th he was again aspirated and 64 fluid ounces of thick creamy pus withdrawn. It contained numerous short chains of streptococci. In view of the more definitely purulent nature of the fluid, it was decided to open the pleural cavity that evening; 25 fluid ounces of pus containing large flakes of lymph, came away. The operation, under local anaesthesia, was well borne. Though there was a copious discharge each time the wound was dressed, the patient's general condition continued to improve, his temperature becoming normal.

On November 10th he was discharged to a shore hospital, where convalescence was soon established, and his further progress was uneventful.

It was my opinion that the original infection came from the tonsils, and I advised him to have them removed. This was done later, and in July he wrote to me saying that his condition was quite satisfactory. Since then he has been passed as fit for general service.

Reference.
[1] British Medical Journal, November 13th, 1915.

TREATMENT OF PSORIASIS IN THE ARMY.

By
H. W. BARBER, M.A., M.D., M.R.C.P.,
Captain R.A.M.C.(T.C.).

The importance of psoriasis as a cause of disability among troops is not great, but men with an extensive eruption require treatment. At the time of writing, out of 1,100 patients admitted to hospital for skin disease, 56 (that is, about 5 per cent.) are being treated for this complaint. In order to return these cases to duty as quickly as possible I have recently adopted the following method, which has afforded more rapid and uniform results than any other that I have yet tried.

1. *Treatment of a Generalized Eruption on the Body and Limbs.*

The patient attends for treatment twice daily. Every morning he is given a bath, to which on the first two days cresol (1 oz. to an ordinary sized bath) and an alkali

(a handful of sodium or potassium carbonate) are added; on subsequent mornings the cresol is omitted. After the morning bath, and again in the evening, the following ointment is applied to all affected parts from the neck downwards, excepting the genitals;

℞ Chrysarobin.	...	gr. 10
Acid. salicylic.	...	gr. 15
Acid. carbolic.	...	gr. 10
Zinc oxide	...	dr. 1½
Lanoline } Vaseline }	āā ad	oz. 1

Throughout the period of treatment a suit of pyjamas is worn next the skin night and day, and thus becomes thoroughly impregnated with the ointment. The patient is inspected by the medical officer at least every second day.

As a rule the ointment is well tolerated, but, should any area of skin become acutely inflamed and tender, the application of the ointment to that part is at once discontinued, and, instead, some soothing preparation, such as Lassar's paste* (to which a little ichthyol may well be added), is kept thickly applied to the affected region. The genitals are throughout protected by Lassar's paste.

At the end of a week, sometimes earlier, the eruption in most cases is to a large extent cleared, whereupon Lassar's paste, containing 10 grains of salicylic acid to the ounce, is applied to the treated parts, to allay irritation and assist desquamation. A clean suit of pyjamas is at the same time issued to the patient, and at this stage a bath on alternate days only is given.

2. *Treatment of Resistant Patches.*

It will usually be found that a few active patches remain after the greater part of the eruption has disappeared. Such areas are commonly seen on the elbows and knees, wrists and hands, in the hollows just behind the great trochanters, and sometimes elsewhere. In the treatment of these a stronger ointment is employed as follows:

℞ Chrysarobin.	...	gr. 20
Acid. salicylic.	...	gr. 25
Acid. carbolic.	...	gr. 10
Zinc oxide	...	dr. 1½
Lanoline } Vaseline }	āā ad	oz. 1

This is rubbed well into the patches twice daily, and is also kept applied to them on lint during the night, providing that the healthy skin immediately surrounding them is not actively inflamed.

3. *Treatment of the Scalp and Forehead.*

In order to prevent the occurrence of conjunctivitis the chrysarobin ointment is not used for these parts. The hair is cut very short, and the scalp shampooed three times a week. An ointment of the following composition is kept applied by means of lint, or, better, a closely-fitting linen cap:

℞ Acid. pyrogallic.	gr. 10
Acid. salicylic.	gr. 15
Acid. carbolic.	gr. 10
Ung. hyd. ox. flav.	oz. 1

4. *Treatment of the Face and Front of the Neck.*

As a rule, psoriasis of these regions will yield to zinc ointment containing 10 grains of ammoniated mercury and 20 to 30 grains of salicylic acid. In more resistant cases the pyrogallic acid ointment, as recommended for the scalp, has proved effectual.

5. *Internal Treatment.*

The external treatment described has up to the present been uniformly successful in clearing even the most extensive eruptions in a comparatively short time. Its object is to render a man fit for duty as quickly as possible; it will not, of course, prevent relapses.

Internal treatment is only adopted in certain cases. As regards diet, probably the most important factor to be considered in the prevention of relapses, it would in most instances seem hardly worth while to attempt to control it, seeing that the patients will return to active service conditions after their discharge from hospital. Florid individuals, however, with an inflamed eruption are kept for a time on a milk diet, with plenty of fluids, and freely purged, and a mixture containing vinum antimoniale and potassium citrate is prescribed thrice daily. In another class of patient there is evidence of intoxication from some septic focus—frequently, apparently, the mouth. In these cases a thymol mouth-wash is directed to be used several times a day, the sockets of the teeth are cleansed with hydrogen peroxide, the bowels are kept well opened, and a mixture containing dilute hydrochloric acid and nux vomica is given after meals. After their discharge they are recommended for dental treatment.

Contraindications and Modifications.

Very acute cases, and those in which the eruption is inflamed and angry-looking, should not be treated at once with the chrysarobin ointment. Free purgation and diuresis, a milk diet, and the administration of vinum antimoniale, together with the local application of Lassar's paste containing salicylic acid and ichthyol, form the lines along which treatment should first be directed. When the acuteness of the eruption has subsided the method of treatment already described may be cautiously begun.

No patient who is suffering from boils or other forms of pyodermia should begin the treatment until these have been cured; otherwise very acute dermatitis is apt to be provoked.

Psoriasis is not uncommonly seen in persons of the seborrhoeic diathesis, and impetiginized seborrhoeic eczema of the face, scalp, ears, and neck sometimes coexists with psoriasis of the trunk and limbs. In seborrhoeic subjects not only does the character of the psoriatic eruption differ from that usually seen, but the distribution is apt to be that of a seborrhoeic eczema—that is, the flexures and midline of the back and chest tend to be involved. As seborrhoeic subjects are peculiarly susceptible to all forms of external irritation the treatment of psoriasis in them must be carried out under very careful supervision in order to avoid chrysarobin dermatitis. The following alkaline citrate mixture is very useful in these cases: Sodium citrate gr. 30, potassium carbonate gr. 15, and sodium bicarbonate gr. 15, thrice daily one hour before meals.

Conclusions.

Although this method of treatment may not appear to differ materially from those usually employed, the fact remains that no other preparation I have ever used has given me nearly such rapid results. This, too, is the experience of my colleagues, all of whom are dermatologists. We are agreed that the carbolic acid, incorporated in the ointment, must have some specific effect. Whether its action is local, or whether it depends on absorption cannot be proved, but it is interesting to note that Kaposi considered that carbolic acid given internally was as effective as arsenic in the treatment of psoriasis. No ill effects have as yet been noted, but, of course, the possibility of renal irritation and carboluria must be considered. For this reason application of the ointment over a wide area must never be continued for longer than a week without a break; fortunately the eruption over the greater part of the body is usually cleared at the end of this period.

Apart from any special virtue of the applications used, I would lay great stress on the thorough supervision of the treatment as a factor in its success.

I wish to express my gratitude to Major MacCormac, R.A.M.C., who has kindly given me every facility for the carrying out of the treatment, and to my colleagues, Captains Semon, Small, Stewart-Smith, and Pellier, for providing me with cases.

* The formula for compound zinc paste (B.P.C.) for which "Lassar's paste" is a synonym, is as follows: Zinc oxide finely sifted and starch in powder, of each 24 parts; salicylic acid in powder, 2 parts; soft paraffin (white) 50 parts. The salicylic acid may be omitted, but the name "Lassar's paste" is retained.

ELECTRICAL TREATMENT OF MUSCLES IN "TRENCH FEET."

BY

FLEET SURGEON G. MURRAY LEVICK, R.N.(RET.).

A NUMBER of cases of trench feet have been treated very successfully in the Electrical Department at Tooting Military Orthopaedic Hospital.

At first nearly all the patients were sent from the wards with a request for radiant heat treatment. After a short trial this was abandoned completely. Not only was it no use, but in nearly all cases the patients complained that it increased their pain instead of relieving it. As already

pointed out by Mr. Jocelyn Swan and others, the application of heat in any form in the more acute stages is contra-indicated, and relief is more likely to be found in cooling applications than in hot baths or radiant heat.

In the later stages, with which we are here concerned, there is functional loss of movement in the intrinsic muscles of the foot, with or without pain and swelling. The muscles have been completely inactive for some time and are wasted. Tissue changes have taken, and are taking, place. In addition to the blood extravasation through the walls of the damaged blood vessels, there has been inflammatory invasion of the surrounding tissues, and the products of this are not removed owing to stagnation in the veins and lymphatics. Massage and passive movements of the foot give much relief and do a great deal of good, and I think that, apart from electrical means, there is no better treatment to adopt, especially if it is carried out after immersion in hot water. In addition to this, however, some means of getting rhythmical contraction of the muscles is urgently called for, as it is the best method for re-establishing lymphatic and blood efflux; if this be left until too late, permanent tissue change will take place, with loss of muscular function, commonly leading to flat-foot.

Method of Application.

The patient sits with his feet in a warm foot-bath, deep enough to rise above his ankles. If it does not cause pain the temperature of the water may be 110° F. If this is painful, lower temperatures may be used.

After a quarter of an hour, water is removed from the bath until only the soles of the feet are covered as they rest flat on the bottom of the bath, the water rising between the toes, but not into the dorsum of the foot.

An indifferent electrode of a faradic circuit is connected to a piece of wet lint which encircles the ankle of the foot to be treated; it is better to do one foot at a time. The active electrode, a carbon plate, is first immersed in the water in front of the toes.

A metronome is in the circuit, making not more than fifty interruptions a minute, and the current is gradually introduced. It will be seen now that rhythmical contraction is taking place in the foot. The action of the interossei and flexors and extensors of the toes can be seen in a remarkably satisfactory manner. The simultaneous action of the opposing sets of muscles is unavoidable, and matters little, because the object in view is attained—namely, a rhythmical contraction and relaxation, with the certainty of increased blood supply, and efflux of blood and lymph from the part.

The stimulus should be weak at first, but it will be found as a rule that a good contraction of the muscles can be borne from the start if the whole of the above technique is followed exactly. The position of the electrode in the water can be adjusted in its relation to the foot, thus allowing a diffusion of the stimulus before it enters the tissues, and a more even application to different parts. Careful watch should be kept on the muscle contractions the whole time, and the treatment should be discontinued as soon as the muscles show signs of fatigue. This point will take longer to reach as the treatment progresses.

Results.

So satisfactory is this method, and so pleasing the appearance of the part, with the parting and closing of the toes by the action of the interossei, that it at once suggests itself as the best method of applying any form of electrical stimulus to the muscles of the feet, for whatever reason. It is highly probable, though hard to prove, that the deeper layers of muscles are all stimulated in some degree. On moving the electrode to the outer side of the foot, the abductor minimi digiti is seen to start rhythmical contraction, and on the inner side the abductor hallucis may be stimulated, and so on.

After this treatment voluntary movement will soon return in most cases, and care should be taken to elicit this as soon as possible. When it is established, regular and carefully selected exercises should be given until the muscles have regained their tone and ready response. Above all things, until tenderness has disappeared from beneath the feet on pressing them to the ground, the patient should not be allowed to walk about the hospital. His first essays in walking should all be carried out under instruction, as otherwise he will probably develop a bad style, and I have seen cases of flat-foot which I believe to have been acquired in this way.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MALIGNANT DISEASE AFTER INJURY.

UNDER present war conditions injuries to bone, accompanied or unaccompanied by suppuration, are of relatively great frequency. In addition to bone lesion, such injuries may be associated with extensive cicatrization. In view of the common belief that squamous cell carcinoma is liable to occur in an ulcer or scar of long standing and that sarcoma is liable to supervene on injury to bone, I have examined the records of the Middlesex Hospital in order to obtain some idea of the future chances of the wounded soldier in these two respects.

Out of over 10,000 records of malignant disease less than 1 per cent. are examples of cancer affecting the skin of trunk or limbs. Amongst these, cases of carcinoma arising on scars form a very small proportion and have chiefly been associated with cicatrices from extensive burns. Somewhat allied to this class are rare cases affecting the face where lupus has been treated with *x* rays, and the less uncommon cases where cancer has developed on the scalp at the seat of a sebaceous cyst of long standing.

Histological diagnosis indicates that sarcoma constitutes about 9 per cent. of all malignant disease, affects practically all regions of the body, and occurs at all ages with fairly uniform distribution. Direct association of sarcoma with injury is not often recorded; when it is stated to have occurred the sarcoma most frequently affected a long bone.

So far as concerns date of onset of the malignant disease after the trauma carcinoma and sarcoma are in marked contrast; "one year since injury" is an average period when sarcoma is said to have followed on injury of a long bone; "twenty years since injury" is an average period when carcinoma develops in a scar.

It will be seen, therefore, that past experience is reassuring; the probability that a given soldier will suffer from malignant disease at the site of his wound is so small that it may be neglected. Nevertheless, the total number of wounds, injuries to bone, and cicatrices will be very considerable, and there can be no doubt that examples of the type of malignant disease under consideration will not be infrequent in coming years.

W. S. LAZARUS-BARLOW,
Director.

Cancer Research Laboratories,
The Middlesex Hospital.

GUNSHOT WOUND OF ABDOMEN IN A BOY.

A BOY, aged 6, was admitted to the Royal Devon and Exeter Hospital on the evening of November 19th, having been brought from Chagford in a motor car. With other children he had been playing with a loaded rook rifle when it went off; the bullet entered his abdomen on the right side of the umbilicus, and was evidently directed upwards. On admission the child was very collapsed and his clothing saturated with blood.

He was taken to the theatre and anaesthetized; the abdomen was washed with methylated ether and painted with tincture of iodine. An incision about 4 in. long was made to include the entry wound, from which blood was flowing freely. On opening the abdomen the lower part was found full of blood, which was wiped out and the pelvis packed with gauze; the coils of small intestine were then in turn taken out of the abdomen on to hot Cripps pads and the wounds in the small intestine sought for and in turn sutured; there were sixteen wounds, and from some of them portions of food and blood clot were protruding; the last hole was in the left mesocolon. The operation wound was sutured in layers and closed and the child put back to bed. A normal saline enema with glucose was ordered every six hours. As the last coil of the ileum was being returned a very long and slightly inflamed appendix made its appearance; to avoid possible future trouble this was removed in the usual way.

The temperature was 100.8°; it rose on the next day to 101.6°, and on the evening of the third day to 103°, but the next morning it fell to 100°, and did not afterwards rise above 99° except on the seventh day, when all external stitches were removed. On this day the child was observed to have some irritation posteriorly in the left loin; a hard point which could be felt under the skin was cut down upon and a small rifle bullet easily extracted.

The child made a good recovery, and was discharged cured on January 12th no whit the worse for his experience.

EDWARD J. DOMVILLE,
Consulting Surgeon and House-Surgeon, Royal Devon and Exeter Hospital.

AN ERRANT RABBIT BONE.

THE report on February 2nd, 1918, p. 166, of an errant fish-bone by Dr. I. David of Colombo brings to mind a similar incident in which a rabbit bone was concerned. I attended a gentleman, aged about 50, in March, 1882, on account of a swelling in the left iliac fossa, with symptoms of colic. A week later I found him still in bed with a temperature of 104°, when he was suddenly seized in my presence with vomiting and purging. Although enjoined by me to stay in bed he went to business next day and considered himself well.

Some months after, the late Mr. Reginald Harrison read at the Liverpool Medical Institution[1] a case in which a rabbit bone had passed by the urethra. On asking Mr. Harrison for particulars I found we had both had to do with the same person. It seems that in April, 1882, this gentleman was seen by Mr. Harrison on account of a large swelling at the base of the bladder, irritability of that organ, pus in the urine, and the escape of gas bubbles at the end of micturition. Later, in the urinary deposit striped muscular fibres were found. Early in June, 1882, he reported himself greatly better after the passage by the urethra of a bean-like body ¾ in. long, which he brought to Mr. Harrison and had taken for a stone. This on being cleaned proved to be part of a rabbit's femur. Gas bubbles continued to issue for a few months, but during the following year he became quite well.

It is evident that during my attendance the bowel was undergoing perforation and adhesion to the bladder, with a toxic "crisis" evinced by the vomiting and diarrhoea. Later the perforation of bladder and the formation of a vesico-intestinal fistula were proved by the presence in the urine of striped muscular fibres derived from food. No particular date was given on which the patient had eaten rabbit, which, however, he often did.

Mr. Harrison in his report also quoted two similar cases: (1) a swallowed hair pin passed by the urethra as a calculus, of which it formed the nucleus;[2] and (2) a swallowed piece of slate pencil removed from the bladder by lithotomy.[3]

Liverpool. RUSHTON PARKER.

Reports of Societies.

PURPURA AND HAEMOPHILIA.

AT a meeting of the Section for the Study of Disease in Children of the Royal Society of Medicine on March 22nd, Dr. ROBERT HUTCHISON being in the chair, Major W. PALMER LUCAS, Professor of Pediatrics at the University of California, spoke of clinical experiments he had carried out according to the methods described by Dr. W. H. Howell, Professor of Physiology at the Johns Hopkins Hospital. Three factors were essential to clotting: (1) Prothrombin, (2) thrombin elements, and (3) the substance known as antithrombin, which held the blood in solution. If the coagulability of the blood were decreased there was either an increase of antithrombin (as in cases of purpura due to streptococcal infection and in some cases of jaundice), or a decrease of prothrombin. This occurred in most cases of purpura and in haemophilia. In Henoch's purpura, for instance, prothrombin was decreased during an attack; the decrease was very marked, and the amount of prothrombin present was always below normal. In blood transfusion for purpura he preferred whole blood to serum, as in some serums there was an excess of antithrombin. Good results had been obtained from blood transfusion in purpura, but in haemophilia he had not been able to raise the prothrombin factor enough to obtain success. He usually depended upon rest and local treatment. Haemophilics usually bled up to a certain point and then stopped. If the blood were examined at once (and it was very difficult to get a sample at this time) the factors were practically in the normal condition. The whole factor in coagulation was the balance between prothrombin and antithrombin. Replying to questions, Major Lucas said it was not advisable to employ the method in private homes. A hospital laboratory was required. Kephalin was not by any means a panacea. He had used it on haemophilics, but it had not had much effect. There were, he said, two types of the haemorrhagic disease of the newly born: (1) in which the antithrombin factor was increased—the septic cases belonged to this type, and the mortality was very high on this account; (2) in which there was diminution in the amount of prothrombin. In one case recovery followed whole blood transfusion. So far he had done no work on syphilitic cases. The reason for the want of balance between prothrombin and antithrombin was at present being worked at, but, so far, analyses had given no results. The investigation was difficult on account of the number of tissues that had to be analysed. In rheumatic purpura prothrombin was usually deficient. He had noticed that haemophilic patients were often able to predict the moment of recovery. This was especially so in the case of children, who often announced that they were "now going to get quite all right," even though there appeared to be no change in the condition. It was often possible to tell the moment of recovery even from the facial expression.

VALUE OF X-RAY TREATMENT.

AT a meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland, on February 15th, Dr. W. G. HARVEY, Major R.A.M.C.(T.C.), assistant physician and in charge of *X*-ray Department, Adelaide Hospital, Dublin, gave an estimate of the value of *x*-ray treatment in various conditions, founded upon an experience of over 500 cases. His observations were summarized as follows:

1. Ringworm. In this the rays were used as an epilating agent. A fortnight after a proper dose of *x* rays the irradiated area shed all its hair, healthy and parasitic, while some three months later a new growth of hair, free from the parasite, occurred. This treatment was the best for the cure of ringworm. It was certain, painless and rapid, and left the child free from infection within a month of starting. There were, however, many technical points which required attention, or accidents—for example, alopecia—might occur.
2. The results in favus theoretically should be equally good, but such cases often became reinfected.
3. Rodent ulcers in general did well, unless the periosteum or cartilage were involved. True epithelioma were more variable, but many responded well to *x* rays.
4. Epithelioma on a lupus site should never be treated with *x* rays—the results were very bad.
5. Warts—senile and juvenile—were amenable to *x*-ray treatment. Four cases of warty growths on the feet did well.
6. Keloid was satisfactory in its response to *x* rays.
7. Lupus did well, but the cosmetic results of Finsen light were probably better. Tuberculin injections appeared to favour the treatment.
8. Lupus erythematosus was not benefited.
9. The results with tuberculous glands had not been all that was to be desired.
10. Actinomycosis (one case) was not affected. In the treatment of neoplasms and deep-lying tissues much improvement had been obtained since the methods of "filtration" and "cross fire" were introduced.
11. The symptoms of Graves's disease subsided under *x* rays. No considerable benefit was derived in simple goitre.
12. Malignant tumours, whenever possible, should be surgically removed. When that was impossible *x* rays might occasionally bring about a cure, and frequently relieved pain and diminished the tumour.
13. Uterine myomata and enlarged prostates required massive doses of *x* rays, but with them appeared to do well.

In the discussion which followed Dr. MOORHEAD said that he looked on *x* rays as a specific in the treatment of Graves's disease, but Dr. CROFTON raised the question whether there might not be danger of thyroid insufficiency following the treatment.

[1] *Liverpool Medico-Chirurgical Journal*, 1883, p. 185.
[2] Mr. Brownhill, *London Medical Gazette*, October, 1845.
[3] Mr. Alfred Roberts, Sydney, N.S.W., *Med. Times and Gazette* July 30th, 1859.

TREATMENT OF TUBAL STERILITY.

AT a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland, on February 22nd, Dr. HASTINGS TWEEDY read a paper on the cure of sterility by means of catgut strands passed through the Fallopian tube into the uterus, and showed a specimen of ectopic gestation removed from a tube which had been resected on two previous occasions. On the second occasion catgut was placed in position; the specimen showed a free passage to spermatozoa. He attributed the tubal pregnancy to the irritative effect of chromicized catgut, and held that some less harmful material must be employed in future. He described a method which would make it possible to pass silkworm gut through the tube, and to remove this gut in three or four days by the extraction from the uterus of a plug of iodoform gauze. He maintained that the first three days constituted the critical period for the keeping open of the tube after resection, and said that in 50 per cent. of women, sterile in spite of curettage and other local treatment, the sterility resulted from occlusion of the tubes.

Dr. BETHEL SOLOMONS read notes of a case of extra-uterine pregnancy resulting after resection of the tube and insertion of catgut to keep it open. The patient had had five children, and sought advice because she had not become pregnant for four years. A retroverted uterus with salpingitis was found. The left tube was resected and chromic catgut No. 4 inserted in the lumen. The right tube was dilated with air, and a Gillian operation was performed. Two months later a left tubal pregnancy of five weeks' duration was removed. Dr. Solomons considered the insertion of catgut in the tube to keep it open after resection to be a rational procedure. He doubted if chromic catgut made tubal pregnancy more likely; he was of opinion that when this occurred it was due to an uncured salpingitis.

The PRESIDENT of the Academy said that it was probable that some peristalsis occurred in a healthy tube, having regard to its structure, but it had not yet been demonstrated. He was inclined to question the soundness of the view that a piece of gut placed in the lumen of the tube had any irritant action.

Dr. FITZGIBBON said the idea of passing something down the Fallopian tubes to act as a bougie and maintain their patency was an advance in the treatment of tubal sterility. It was impossible at present to judge the efficacy of the method, and even the methods of clearing the tube of adhesions and kinks gave a certain number of good results. He thought the clearing of the fimbriated end the main thing in the operation, and if this were feasible and the fimbriae in good condition, satisfactory results might be expected in a fair number of cases, without the resection of any part of the isthmus of the tube, except where there was marked disease.

The President of the Section (Dr. ALFRED SMITH) considered that a hydrosalpinx where there was little interstitial hypertrophy gave best results in salpingostomy. Where there was much interstitial hypertrophy it seemed hopeless to operate. He recalled cases where healthy children were born after salpingostomy. He was not quite satisfied with insufflation as a test of the permeability of the tube, and preferred the injection of warm saline through the uterus by the Bozeman catheter. In this method the return flow was blocked by the finger; this raised the tension within the uterus and, if the tube were permeable, forced the saline through the tube in droplets. The catgut bougie was not convincing; it might, however, make a useful splint to ensure accurate adaptation in the end-to-end anastomosis.

WE have received the first number of the *Revista del Institutio Bacteriologico del Departemento Nacional de Higiene* of Buenos Aires, in which work done in the laboratories of the institute is to be published. It will also serve as a central organ for the work of researchers on microbiology, hygiene, and experimental medicine, published in Spanish America. The new review is a handsome volume, and the first number contains, among other papers, communications on the specific precipitating properties of anti-snake-venom serums by B. A. Houssay and J. Negute; studies on experimental poliomyelitis by R. Kraus and L. Kantor, and on the antigen of the miostagmine reaction in malignant tumours by A. H. Roffo.

Reviews.

WOUNDS OF PLEURA AND LUNG.

ONE of the most recent additions to the Collection Horizon is a well balanced work on wounds of the pleura and lung by a surgeon, Professor GRÉGOIRE, and a physician, M. COURCOUX, both members of the staff of the Paris hospitals.[1] The book is of special interest in connexion with the burning question, referred to in the review of Pierre Duval's book on war wounds of the lung (vide BRITISH MEDICAL JOURNAL, 1917, ii, 420), of the advisability of early surgical interference to prevent rapid death from intrapleural haemorrhage. In their full discussion of this problem the authors point out the danger of moving such patients, and the practical difficulties of operating in such cases near the front. One of the questions that have to be answered is whether or no haemorrhage has stopped. On this fact they maintain that coagulation of blood withdrawn from the chest by an exploring syringe is evidence that bleeding is going on, and that operation should be undertaken; on the other hand, if the blood does not clot it may be concluded that the haemorrhage has ceased and that operation is unnecessary. While generally in favour of tapping a sterile haemothorax, the authors recommend waiting a week, as a rule, and do not advise the introduction of air or oxygen to prevent too rapid expansion of the injured lung. A raised temperature associated with an increased number of leucocytes in the blood withdrawn from the pleura does not, in the absence of obvious pus, justify the opinion that the haemothorax has been infected. These conclusions depend on the interesting account given of the changes undergone by the blood in the pleural cavity. The blood, which is usually derived from the lung rather than from the chest wall, does not coagulate unless the pleura is infected or its endothelium damaged, and further, after about five hours it does not coagulate outside the body. There appears to be some anticoagulating agent present, as this blood prevents coagulation in blood added to it. At first the intrapleural blood contains an excess of polymorphonuclear leucocytes, but about the sixth day 60 per cent. of the leucocytes are eosinophils, and macrophages are present. Haemolysis occurs and bilirubin appears, thus confirming the extrahepatic formation of bile pigment.

The work is divided into sections on (*a*) uninfected wounds, (*b*) infected wounds, and (*c*) their sequels. Analysis of over 50,000 war wounds shows that 5 per cent. are of the chest, and that, in contrast to others, those of the chest are relatively seldom infected—in about 15 per cent. The lung is not a favourable site for the growth of the anaërobic *Bacillus welchii*, but this infection, when it does occur, is almost always fatal. Infection on or soon after the fourth day leading to empyema proves fatal in about half the cases. Pneumonia and bronchopneumonia, very rare indeed in association with sterile haemothorax, occur in some of the infected cases and render the outlook extremely grave. The fear that pulmonary tuberculosis may be induced by these chest wounds is shown to be unfounded.

MINOR MALADIES.

THE fourth edition of Dr. LEONARD WILLIAMS'S arresting little book on *Minor Maladies*,[2] revised, enlarged, and brought up to date in medical outlook, is a volume of interest to all practitioners of medicine. Combining as it does both nutritive and irritant properties in a high degree, it forces the reader to think; and, whether he agrees with all he finds in it or not, he will arise from its perusal stimulated, informed, and amused. In the present edition the author lays stress on the study of the internal secretions, and of their influence on the course and causation of health and disease. The future of medicine lies with the endocrine glands, just as its immediate past was ruled by bacteriology. So the author; and he makes out an excellent case for his views in the ten chapters into which his book is divided. The longest of these is that devoted to "goutiness," a term used as the equivalent of "insufficient

[1] *Plaies de la plèvre et du poumon.* By R. Grégoire, Professeur agrégé à la Faculté de Paris, and A. Courcoux, Médecin des Hôpitaux de Paris. Collection Horizon. Précis de Médecine et de Chirurgie de Guerre. Paris: Masson et Cie. 1917. (Cr. 8vo, pp. 212; 44 figures. Fr. 4.)

[2] *Minor Maladies and Their Treatment.* By Leonard Williams, M.D. Fourth edition. London: Baillière, Tindall, and Cox. 1918. (Cr. 8vo, pp. xii + 402. 7s. 6d. net.)

or perverted metabolism." Lack of space unfortunately prevents us from following the author into the ramifications of this protean disorder. We wish this interesting and well-written little book the wide popularity it deserves.

THE JEWISH CHILD.

DR. FELDMAN'S book, *The Jewish Child*,[3] is the work of one well skilled in the ancient learning and familiar with the traditional beliefs and customs of the Jews, but equally at home in the sphere of rational medicine. He traces the teaching of the Jews as to heredity and eugenics, marriage, pregnancy, embryology, birth, childhood, and adolescence through the Bible and the Talmud, and compares it with the results of modern research. Bacon speaks contemptuously of the fables of the Talmud, and Lightfoot, who gave his life to its study, was disgusted by the *stupenda inanitas* of its contents. In that strange medley of legend and mystical lore, however, there is not a little practical wisdom besides some shadowy anticipations of doctrines now established on a scientific basis. If Dr. Feldman has not altogether escaped the danger that besets such inquiries of reading deeper meanings into old texts than can fairly be found in them, his interpretations are always ingenious and plausible.

The importance attached by the Jews to everything that concerns the begetting and rearing of offspring is thought to have played a part in conserving and increasing the vitality of the race. It was the ideal of the Jews to produce and perpetuate healthy, beautiful, and capable men and women. The influence of injurious conditions in the parent was recognized. The Talmud says that children begotten in drunkenness are mentally deficient; marked difference in age between persons wishing to marry was regarded with disfavour, and the union of imbeciles was discouraged as likely to result in the propagation of imbecility. Midwives are often mentioned in the Talmud, and some of them seem to have been possessed of considerable skill. Caesarean section was performed on the dead mother, and sometimes on the living. Men were forbidden to use measures to prevent procreation, but women were allowed to do so when pregnancy involved danger to the mother or the child. Recourse could even be had to ovariotomy or hysterectomy to produce sterility. Breast feeding was regarded as imperative unless the mother was in bad health. In Talmudic times a child was sent to school at the age of 6. The buildings were lofty and well ventilated, and there is mention of open-air schools. The higher education does not seem to have been open to girls; according to the Talmud the only accomplishment suitable for them was spinning. The child was carefully studied in order to discover what teaching was best suited to its individual powers. It was held that in elementary classes too many subjects should not be taught at once. The strap might be lightly used for the punishment of stubbornness and inattention. Great stress has always been laid on cleanliness of the body, and the public baths were regarded as second in importance only to synagogues and schools. Contrary to popular belief the birth-rate among Jews is lower than that of the general population; they bring fewer children into the world but rear more to maturity. Jewish mothers are more careful than the average Christian of the health of their children. Infant mortality among Jews is at all ages considerably lower than among Gentiles, and the chances of surviving the first critical year are much greater. Illegitimate births are much fewer. Statistics from various sources show that, age for age, Jewish children are as a rule shorter and lighter than the non-Jewish, and have a smaller chest measurement.

Dr. Feldman's book is full of interesting matter, and his use of the facts which he has gathered from the most varied sources is suggestive if not always convincing. He has made a valuable contribution to the study of a people which, under many disadvantages, has written its mark deep on human history. Were military predominance the vital principle of an enduring national prosperity the Jewish race would have perished long ago. One of the secrets of their preservation is the loving care lavished on their children, and this regard for the welfare of the future citizens affords the best hope for the success of the interesting experiment which is now, thanks to British statesmanship and British arms, about to be tried in Palestine.

[3] *The Jewish Child: Its History, Folklore, Biology, and Sociology.* By W. M. Feldman, M.B., B.S.Lond. With an Introduction by Sir James Crichton-Browne, M.D., D.Sc., LL.D., F.R.S. London: Baillière, Tindall, and Cox. 1917. (Demy 8vo, pp. xvi + 453; 2 plates, 13 figures. 10s. 6d. net.)

NOTES ON BOOKS.

DR. LACHLAN GRANT of Ballachulish has reprinted from the *Caledonian Medical Journal* an address on *Keeping Fit*, delivered to the guard of the German prisoners of war while he was acting as medical officer to the prisoners of war camp, Kinlochleven.[4] It is a summary in simple language of the laws of bodily and mental hygiene. There is much sound advice as to food. The Roman soldier conquered the world on a diet of ground corn boiled in water, and on campaign Caesar shared the fare of his men. Mark Antony had been daintily brought up, yet, when the occasion called for self-denial, he drank "puddle water," and ate the barks of trees and "such beasts as never man tasted of their flesh before"; and this "was borne so like a soldier that (his) cheek so much as lank'd not"; but all men are not cast in this heroic mould. Dr. Lachlan Grant rightly insists that, in order to keep fit, mental control and moral discipline are necessary in addition to physical culture. The will may be strengthened by practice in right thinking—that is, resolutely looking at things in their true perspective and not suffering oneself to be disturbed by every rumour or scared by any of the inevitable reverses that occur in every war. Hannibal, Caesar, Napoleon, Nelson, Wellington, and other great commanders had their full share of such misadventures, and were denounced as incompetent by the pessimists of their day. We should, in Dr. Grant's words, "guard our thoughts against what may be termed the deleterious microbes of the mind which tend to maim our mental control." Moral discipline, which means the adjustment of one's conduct and emotions to the promotion of the highest interests of the community, is a vital factor in the maintenance of fitness in the individual as in the nation as a whole. In the recognition and application of this truth lies the hope of restoring civilization and building a new and better world on the ruins left by the devastating hand of war.

[4] Glasgow: Printed by Alexander Macdougall.

FOODSTUFFS FOR PATHOLOGICAL LABORATORIES.

THE Medical Research Committee has recently brought to the notice of Lord Rhondda the special difficulties confronting the directors of pathological and other scientific laboratories in the regulations relating to food supply. Many instances have been brought to the notice of the Committee in which scientific work of the highest national importance has been endangered by difficulties, under existing conditions, in obtaining necessary foodstuffs in sufficient amount or variety, though the total amount required is quite negligible in relation to the general food supply.

The Ministry of Food has now issued the following memorandum for the guidance of Food Control Committees:

Food Office Instruction No. 15.

MINISTRY OF FOOD.

MEMORANDUM FOR THE GUIDANCE OF FOOD CONTROL COMMITTEES.

Supplies of Foodstuffs to Pathological Laboratories.

1. Lord Rhondda's attention has been called to the difficulties experienced by scientific laboratories in obtaining the small quantities of foodstuffs required by them for the purposes of their scientific work.

2. These laboratories throughout the country are engaged on work of the greatest importance both for civilian medical practice and for the maintenance of the health of the Navy and Army.

3. The Food Controller is authorizing laboratories duly licensed by the Home Office under Act 39 and 40 Victoria, cap. 77, to obtain supplies of any rationed article on production to the supplier of a certificate signed on behalf of a laboratory to the effect that they are necessary for the purposes described above. In due course special Order Forms will be issued to such laboratories for this purpose. Committees should also assist such laboratories in obtaining necessary supplies of unrationed foodstuffs in case they experience difficulty in securing them.

4. A statutory order will shortly be issued by the Ministry of Food exempting from the provisions of the Food Controller's Orders the use of grain and other foodstuffs in any such licensed laboratories for the maintenance of animals or for the preparation of laboratory materials.

LOCAL AUTHORITIES DIVISION,
March 23rd, 1918. MINISTRY OF FOOD.

British Medical Journal.

SATURDAY, MARCH 30TH, 1918.

MEDICAL REINFORCEMENTS FOR THE WESTERN FRONT.

AN APPEAL BY THE MINISTRY OF NATIONAL SERVICE.

THE result of the concentrated German attack on the southern part of the Western Front from a point south of Arras to La Fère may have disappointed the enemy's hopes, but it has disappointed also the expectation of the British Command that it would be possible to hold a line considerably to the east of the Somme.

The country fully understands the position, particularly the threat to Amiens by the approach to Albert. The enemy claim that during the first five days (March 21st to March 25th) they took 45,000 prisoners, besides guns and great stores of supplies. This claim has not been denied by the War Office; in that total must be included many medical officers not only of the battalions, but also of field ambulances and probably some casualty clearing stations. The fighting throughout the area, both where most and least ground has been yielded, is officially described as very severe, and it is certain that the number of casualties to be treated by the British Army Medical Service, even allowing that many wounded fell in areas overrun by the enemy, and are now prisoners, must be very large.

The emergency is so great that the Ministry of National Service makes an urgent appeal to members of the medical profession to come forward with offers of voluntary service to meet the existing pressure. The appeal is made—

First, to medical men now in this country who have relinquished their commissions and have not rejoined. Their services are immediately and urgently required with the armies in France.

Secondly, an appeal is made to medical men under the age of 55 who are physically fit to offer their services either at home or abroad.

The statutory Professional Committees have the practical aspects of the matter under close consideration, and are working in immediate touch with the Ministry of National Service. We understand that a letter conveying this appeal and stating the conditions of service proposed will be sent to all medical men who are believed to be in a position to respond.

We are aware that the number of men in these categories who can be available is small, and we know that in many areas the number of civilian practitioners has been reduced to a level which has caused anxiety to civilian authorities; but the situation which has to be faced is serious, and we are confident that the voluntary spirit of medical men will face it. Every one of them who responds immediately will be performing an act of practical patriotism as well as of individual fortitude.

THE DEMAND FOR AN INCREASED CAPITATION FEE.

THE main business of the special conference of representatives of Local Medical and Panel Committees, to be held on April 11th at the Connaught Rooms, will be to consider the position with regard to the demand for an increased capitation fee put forward by the last annual conference, and the unfavourable reply thereto of the Chairman of the National Health Insurance Joint Committee. The Insurance Acts Committee was instructed to press for an increase in the capitation fee from 7s. to 10s., this sum to cover the increased liabilities in respect of discharged disabled soldiers and sailors and all services now rendered to tuberculous patients by panel practitioners. The decision of the conference was conveyed by letter to the Insurance Commissioners early in November; a deputation waited on the Commissioners ten days later, and on December 8th a memorandum * setting out the reasons for the demand was forwarded to Sir Edwin Cornwall. On February 19th the Insurance Acts Committee had an interview with the Insurance Commissioners, when Sir Edwin Cornwall, in his capacity as chairman of the Joint Committee, read a long statement, which in substance amounted to a refusal to grant any general increase in the capitation rate to insurance practitioners. Sir Edwin Cornwall had spoken of receiving a deputation to discuss the whole subject with him personally, but, in fact, his reply had already been printed; the interview, for all practical purposes, was merely an occasion for hearing this White Paper read. Every insurance practitioner has now had an opportunity of studying the correspondence which has passed between the Insurance Acts Committee and the Commissioners, including the full text of Sir Edwin Cornwall's statement and of the reply the Insurance Acts Committee had since prepared. The gist of the Government's decision is conveyed in certain passages which may be lifted from Sir Edwin Cornwall's statement without injury to the context. In choosing them we have passed over the debating points and irrelevances with which the refusal is padded out.

Dealing with the effect of war conditions on the doctor's liability for attendance, the conclusion is that "it is difficult in the absence of positive evidence to accept the view that there has been such an actual increase in the amount of medical attendance required per head of the insured as to justify the sanction of the Government being sought for any increase in the capitation rate based upon this ground." Dealing next with the contention that the rise in the cost of living and of the expenses of practice has lowered the effective remuneration of insurance practitioners: "the Minister can only treat the application as one put forward, on war grounds solely, for a general and uniform increase of remuneration to the extent of 3s. per insured person per annum—that is, an increase of over 42 per cent. on the present remuneration—to *all* doctors engaged in National Health Insurance work, without discrimination of any kind between the circumstances of one insurance practitioner and those of another. He is compelled to say that he considers that the application if so presented is not one which the Government could entertain or which it is likely that Parliament would be willing to concede."

This decision is defended on two grounds: First, that expenses of practice admittedly vary widely in different practices, and that the increase in such

* SUPPLEMENT, December 22nd, 1917, p. 123.

expenses due to war conditions is also variable; hence, "no uniform increase of remuneration to *all* insurance practitioners would be a proper method of compensating practitioners affected so diversely." Secondly, such an application must be examined "not as one specially affecting insurance administration, but as related to similar applications from other sections of the community, and therefore to be decided in accordance with the general policy of the Government in dealing with applications of the kind. . . . Such grants as have been made in consideration of hardships produced by the rise in prices have taken careful account of the incomes of the persons in question, and the principle underlying them has been that of mitigating hardship in the case of those persons whose incomes are small. . . . In view of all these considerations, the Government would not be justified in asking Parliament to make, in respect of the increased cost of living, a grant which should apply *uniformly to all insurance practitioners without discrimination*, as proposed by the conference." While, however, Sir Edwin Cornwall could not entertain the application as submitted to him, he professed himself willing to examine a detailed case, if put forward with adequate confirmatory evidence, dealing with hardships due to the increased cost of practice expenses and the increased cost of living. Concerning practice expenses—especially travelling—any case put forward for a suitable grant to meet hardships in this respect was to be supported by the necessary evidence as to the actual amount of hardship thus entailed upon practitioners of different types, and accompanied by suggestions for the equitable distribution of such grants.

The Insurance Acts Committee, believing that this answer if it stood alone would not satisfy the medical profession, asked the Chancellor of the Exchequer to make some authoritative pronouncement as to the general Government policy in regard to applications for increased remuneration. Mr. Bonar Law accordingly received a deputation upon this matter on March 15th, and an agreed report of the proceedings has been issued to insurance practitioners. The Chancellor discussed the claim for an increased capitation fee for insurance practitioners under two heads: (1) in respect of increased out-of-pocket expenses; and (2) on the ground of the higher cost of living. He thought the first point reasonable, but difficult to meet, because the extra cost to doctors must vary very much according to the nature of their practices; he added, however, that if the profession could submit an equitable scheme for meeting these increased expenses the Treasury would be prepared to consider it. He would not accept the second contention. In giving war bonuses to many of the wage-earning classes the Government had made no distinction in respect of income, because this distinction was impracticable; otherwise it would have been right to discriminate between high wage earners and the others. In the case of medical practitioners he could not approve a uniform increase, since the cost of the necessaries of life had risen just as much for the man with a low income as for the man with a high income. He was sure Parliament would not agree to an increase for all doctors irrespective of their incomes, but he promised that the Treasury would consider sympathetically a scheme based on the principle that doctors with small incomes should get some increase on the ground of the higher cost of living. He explained that in dealing with any such claim an income limit of £500 would apply to insurance practitioners, the net professional income being taken as the basis, and it would not be necessary to deal with each case individually, but to take classes of practitioners and different kinds of areas. He was not, he said, prepared to consider any general increase—even a small one—on account of the changed conditions and consequent alterations in the liabilities of insurance practitioners due to the war. He declined also to undertake any partial revision of the general conditions in order to meet the special claims of rural doctors; that, he said, must wait until the general revision. But the Treasury was willing to meet fairly any actual increase in out-of-pocket expenses, claims for which would probably come mainly from rural practitioners.

All the documents are now in the hands, not only of Local Medical and Panel Committees, but of their constituents. The case for an increased general capitation fee has been argued by the Insurance Acts Committee, and the Government has given its reply through the mouths of the Chairman of the National Health Insurance Joint Committee and the Chancellor of the Exchequer. The forthcoming conference will decide what is to be done next. In giving their decision the representatives will, no doubt, bear in mind the circumstances of the present moment.

"PANCREATIC INSUFFICIENCY": COELIAC DISEASE.

ACCORDING to the general regulations permitting invalids to have food in excess of the compulsory rations, reproduced on page 290 of our issue of March 9th, extra meat and fat may be allowed to patients suffering from diabetes, tuberculosis, coeliac disease, and pancreatic insufficiency. The two last conditions were added at the instance of the Scientific Adviser (Sir H. Thompson) after consultation with one of the medical referees to the Ministry of Food, and were not among those recommended by the Committee of Reference of the Royal Colleges of Physicians and Surgeons and the Central Medical War Committee. As is not unnatural, some difficulty has been experienced in connexion with these two additional justifications for a more liberal diet, and especially with regard to pancreatic insufficiency. As diabetes is separately mentioned, it appears that carbohydrate inadequacy of the pancreas is not referred to, and we are therefore left with pancreatic failure to deal with fats and proteins. For the detection of failure to digest proteins laboratory methods, such as Schmidt's nuclein test or Sahli's iodoform capsules, would be necessary, and it seems fair to assume that in ordinary practice "pancreatic insufficiency" would be confined to and based on the presence of large quantities of undigested fat in the stools without jaundice, for the occurrence of pancreatic infantilism, as described by Dr. Byrom Bramwell, is a curiosity too rare to be taken into account. Steatorrhoea, though long known to be associated with pancreatic disease, may occur in other conditions, such as intestinal catarrh and sprue, and to determine both a real excess of fats in the faeces and the cause of the steatorrhoea laboratory tests, quantitative and qualitative, such as those devised by Cammidge, are strictly speaking desirable, but obviously are not practicable in the majority of cases. In ordinary practice "pancreatic insufficiency" will therefore probably be based on the naked eye diagnosis of fatty stools; this leaves a not inconsiderable loophole for error, and it is perhaps a pity that the term "pancreatic insufficiency," which does not appear in the last edition of the *Nomenclature of Disease* (1906) and from a clinical point of view is wanting in clearness and definition, should have been introduced. It might, indeed, have been better to have been content with "excess of fat in the stools"; and, as at present ordained, some statement of the grounds on which this diagnosis is made should be required before the permit is granted. The coeliac disease, described by the late Samuel Gee

in *St. Bartholomew's Hospital Reports* for 1888, is better recognized; Dr. R. Hutchison contributed the article on it to Garrod, Batten, and Thursfield's *Diseases of Children* (1913), Sir W. Osler has given it his imprimatur, and Professor Still has taken it as his subject for the current Lumleian lectures before the Royal College of Physicians; but it did not appear in the *Nomenclature of Disease* (1906). Clinically it is a diarrhoea, mainly of children, characterized by bulky pale stools with the consistency of porridge; etiologically it has been variously connected with disease of the pancreas, of the liver (Cheadle's "acholia"), or with a special intestinal infection (C. A. Herter). From the point of view of treatment, raw or underdone meat, as much as 6 oz. daily for a child of 4 years, is recommended; and this practical consideration, taken in conjunction with its fairly definite clinical features, makes its inclusion less open to question than that of pancreatic insufficiency.

POST-OPERATIVE PNEUMONITIS.

By pneumonitis Whipple[1] means not necessarily pneumonia, but a condition of the lung recognized in 1848, and called, after its describer, Woillez's disease by the French. The lung shows engorgement of the capillaries and exudation into the alveoli of mucus, red blood, epithelial, eosinophil, and mononuclear cells, but no fibrin. As a post-operative event this change is much commoner than is generally thought, and is often dismissed under the casual term "post-operative reaction." Among 3,719 operations at the Presbyterian Hospital, New York, during 1915–16, when this subject was being specially investigated, it was detected in 97 cases, 88 being laparotomies. The most important disposing factors are recent or concurrent inflammation of some part of the respiratory tract, pulmonary congestion, inhibition of the normal respiratory movements by the pain of the abdominal incision, by distension or tight bandaging, debility, sepsis, and cachexia, and increased numbers and virulence of the pneumococcus during the winter and early spring. Five of the cases were regarded as embolic pneumonia, but in no instance was this proved by examination after death, and the widespread belief that post-operative pneumonia is generally embolic is not accepted. Neither can the anaesthesia be regarded as solely responsible, for the cases of pneumonitis may show a higher percentage incidence among cases under local than among those under general anaesthesia. Ether, however, is especially irritating to the oropharynx, and so should never be given to a patient with "a cold." The infective agent is in most of the cases—in 46 out of 69 examined—pneumococcus Type IV,[2] a saprophyte in 60 per cent. of throats, responsible for a short, atypical, and mild form of pneumonia. Fourteen cases showed pneumococci of other (I, II, III) types, and five the influenza bacillus. As a rule there is no initial rigor, no rusty sputum, no sustained high temperature for five to seven days, no severe toxaemia, or alarming symptoms terminating by crisis. The symptoms come on within forty-eight hours of the operation with a sharp rise of temperature to 102° or 104° F., cough, increased respirations, pain, though rarely severe, in the side, more often the right, and usually dullness over the base of one lung; but bronchial breathing does not appear for another two days, and then after another day the fever goes by lysis. Skiagraphy is a valuable means of diagnosis in the early stages, and usually shows a shadow before there are physical signs of frank consolidation. In cases infected with pneumococcus Type IV agglutinins appear during the second week after the onset. Prophylaxis, it is said, consists in avoiding operation, when possible, on a patient with inflammation of the respiratory tract, in care in the anaesthetic, in protection against chills, and in anticipating pulmonary congestion by digitalis four-hourly for thirty-six hours before the operation.

[1] A. O. Whipple, *Surgery, Gynecology, and Obstetrics*, 1918, xxvi, 29-47.
[2] Compare BRITISH MEDICAL JOURNAL, January 12th, 1918, p. 57.

SEROTHERAPY OF SPIROCHAETOSIS ICTERO-HAEMORRHAGICA.

When originally introduced the immunizing serum for icterohaemorrhagic spirochaetosis was injected hypodermically, but since May, 1916, Inada, Ido, Hoki, Ito, and Wani[1] have given it intravenously, and have found this method much more potent. Immune bodies could be demonstrated as complete in the patient's blood five minutes after intravenous injection of 0.5 c.cm. of serum per kilo of the body weight, whereas after hypodermic injection the immune bodies could not be detected until after an interval of eight hours, and were then not completely absorbed. As a rule 60 c.cm. of serum from an immunized horse were given intravenously, irrespectively of the degree of illness; sometimes the whole amount was injected in a single day, sometimes 40 c.cm. on one day and 20 c.cm. the next, or sometimes 20 c.cm. for three successive days. It has not yet been settled which plan is the best. In mild cases a total of 20 to 40 c.cm. is sufficient. The best results follow early injection, and from consideration of the infectivity of the patient's blood, the distribution of spirochaetes in the body, and clinical results it appears that intravenous injection is effective up to the fifth day of the disease. The serum is spirochaetolytic and spirochaeticidal; in two cases its injection gave rise to rigors and a rise of temperature, a serum rash occurred in 3 out of 41 cases treated, but no anaphylactic symptoms were seen. Out of the 41 patients treated, 12, or 29 per cent., died, but after eliminating 3 cases the mortality worked out at 23.7 per cent., or considerably lower than cases not treated with serum. The mortality of patients treated by subcutaneous injection was lower—17 per cent.—but this is correlated with their comparative youth. The serum shortens the duration of jaundice, and it is probable, though not proved, that if given in a pre-icteric stage it may prevent the onset of jaundice. The haemorrhagic tendency is somewhat lessened, particularly from mucous surfaces, and the incidence of suppurative complications greatly reduced. But the fever is not influenced, and the percentage of after-fever is somewhat higher, probably because more patients severely ill recover. From examination of 8 fatal cases Kaneko and Okuda[2] find that the spirochaetes are markedly degenerated and fewer than in cases not treated by serum, and that their disappearance from the organs and tissues is not so well marked after subcutaneous as after intravenous injection, though the manner of their disappearance is the same.

[1] R. Inada, Y. Ido, R. Hoki, H. Ito, and H. Wani, *Journ. Exper. Med.*, 1918, xxvii, 283-303.
[2] R. Kaneko and K. Okuda, ibid., 1918, xxvii, 305-308.

SACCHARIN.

Owing to the very widespread use of saccharin or allied synthetic substances for sweetening beverages in place of sugar, which is now unobtainable in restaurants and tea-shops, many inquiries have reached us as to whether these coal-tar derivatives, taken continuously though in very small quantities, have any injurious effect. Some quite unfounded statements have been made to the effect that saccharin disturbs the digestion, injures the kidneys, or is even responsible for gastric carcinoma. These appear to have been evolved from *a priori* reasoning when they were not the product of the uncontrolled imagination pure and simple. There is no evidence that saccharin or its allies has any effect whatever on the economy, even when it is used in quantities larger than are required to sweeten foods and beverages to suit ordinary tastes. And this in spite of the fact that saccharin has been in use for more than a quarter of a century. The mere fact that it is an artificial substance remotely derived from coal-tar does not necessarily render it poisonous, as some seem to suspect. At the same time, it is of course valueless as a food in the sense in which sugar is a food, and, even as a flavour, is to most tastes inferior to the natural substance.

Glusidum, benzosulphinide, or saccharin, whose empirical formula is $C_7H_5NSO_3$, is an imide prepared from the coal-tar product toluene. When chemically pure it is some 500 times sweeter than sugar, but commercial saccharin is neither a pure nor a uniform product, and often contains less than 50 per cent. of actual glusidum. Besides being a sweetening agent it has antiseptic properties, but these are negligible. In the United States the use of both saccharin and its sodium salt (which is more soluble but less sweet) is prohibited in food or beverages by the Food and Drugs Act. It may be noted that "saxin" is a proprietary preparation said to be considerably sweeter than saccharin, but allied to it in chemical constitution.

FEMININE EQUINISM.

M. QUÉNU, one of the most eminent of French orthopaedic surgeons, has been making investigations, with the help of Dr. Ménard, into the effect of the high-heeled shoe or boot on standing and walking. As M. Kermisson observed in the discussion at the Académie de Médecine, the subject has been forced on male attention recently by the very short skirts that women have taken to wearing. M. Quénu says that the three reasons which induce women to wear the very high heel are that it makes the foot look shorter, that it accentuates the curve of the back, and that it increases the standing height. He admits that the foot looks shorter, because the eye judges its length from the distance between the tip of the toe and the heel of the boot. In one instance, in which the natural length of the foot was 23.5 cm., the distance between the toe and the high heel was only 17.5 cm.; the heel in this case was 9 cm. (3½ in.) high. The gain in height was only 5 cm. (2 in.). Quénu will not admit any advantage in appearance in throwing the abdomen out and the shoulders back; it entails an ugly hollow in the back and an ungainly balance and gait in walking. Quénu and Ménard regard the arch of the foot as resting on two pillars, the heel behind and the broad anterior end of the metatarsal bone of the great toe in front; they look on the other metatarsals as flying buttresses. In an experiment on a man they found that with the foot bare 70 per cent. of the weight was carried by the posterior pillar, 30 per cent. by the anterior, and that the centre of gravity of the body passed through the external malleolus, or slightly in front of it. When a wedge 5 cm. high was placed under the heel the centre of gravity was thrown 1.5 cm. in front of the heel; the proportion of the weight carried by the anterior pillar was increased to 44 per cent. and that carried by the posterior pillar diminished to 56. In another subject, a woman, with the bare foot the distribution of the weight was the same—30 per cent. in front, and 70 per cent. at the heel; but when a wedge was put under the heel, raising it 6 cm., the amount of weight thrown on the two pillars, front and back, was exactly equal. The centre of gravity was thrown far forward, in fact almost to the centre of the total length of the foot as so raised. This extreme alteration in the distribution of the weight on the foot is corrected in a high-heeled boot by putting the heel far forward. In one young woman, whose bare foot was 19 cm. long, the length was reduced to 15 cm., measured from the artificial heel. The centre of gravity passed much less far in front of the heel and the distribution of the weight became normal—namely, 30 per cent. on the anterior pillar and 70 per cent. on the posterior. In another young woman, in whom the length of foot when bare was 23.9 cm., the wearing of a boot with a heel 9 cm. high reduced it to 19.5 cm. Further, the breadth of the heel in contact with the ground instead of being 5.3 cm. wide was only 2 cm. wide. Quénu and Ménard calculated the total area of contact between the foot and the ground in this subject when standing on one foot: with the bare foot it was 105 sq. cm., with the 9 cm. heels it was 50 sq. cm. This diminution was due to bringing forward the heel, so that the normal distribution of the weight between the posterior and anterior pillars was obtained by a very great diminution in the surface of contact. This is what they call, ungallantly, equinism, the horse foot, or hoof foot. So far the arch of the foot has been considered as though it were a single bone; when its actual anatomical structure is considered, it is seen that with a high heel the axis of the calcaneum instead of passing upwards passes downwards, the astragalus, which is nearly horizontal, becomes oblique, and the weight is transmitted through it to the scaphoid. In order to maintain the balance the knee is slightly flexed, and the upper part of the trunk is thrown backwards, the flexion taking place at the second or third lumbar articulation. With very high heels the gait is stiff and each pace is short and hurried, the high heel and the toe coming down to the ground practically at the same moment. Eventually the Academy passed a resolution declaring that the fashion of very high heels was injurious and absurd.

THE PRESIDENCY OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

THE President of the Royal College of Physicians of London is elected annually on the Monday following Palm Sunday. It has long been the custom to re-elect the president for several years, and Sir Frederick Taylor had held office for three years, the term for which it was held by Sir Russell Reynolds and Sir Samuel Wilks. He had intimated his wish, on the ground of health, not to be re-elected, and we regret to learn that he was not able to be present at the meeting last Monday. Dr. Norman Moore was elected president in his place and duly inducted by the senior censor, Dr. Samuel West, who had been in the chair. The new president, who is a graduate of Cambridge in arts and medicine, and consulting physician, St. Bartholomew's Hospital, London, became a Fellow of the College in 1877 and has always shown the deepest interest in its work and welfare. He was Bradshaw lecturer in 1889 and Harveian orator in 1901; he gave the FitzPatrick lectures in 1905 and the Lumleian lectures in 1909. He was censor in 1904–5 and 1908, and has been Harveian librarian since 1910. He has been representative of the College upon the General Medical Council since 1901.

ANATOMICAL NOMENCLATURE.

THE Anatomical Society of Great Britain and Ireland, at a meeting on March 1st at King's College, London, received and unanimously adopted a report by its Committee on Nomenclature. It resolved, without a dissentient vote, that the following paragraph of the report should be circulated among the several corporations and other bodies interested in the progress of medical education: "The Committee, after consideration of the matter, unanimously reports that it sees no reason for departing from the use of the old nomenclature as the recognized medium of description for employment in anatomical textbooks and departments, or by medical men in general; on the other hand, it thinks that there are very good reasons to be urged against the adoption of any other nomenclature for this purpose."

A MINISTRY OF HEALTH.

AT a conference of delegates from the principal Insurance Committees and Approved Societies on March 22nd at the Central Hall, Westminster, Mr. P. Rockliff, President of the Faculty of Insurance, etc., anticipated that the Government bill for a Ministry of Health, of which Dr. Addison is in charge, would be found, when laid upon the table of the House of Commons, to go far to provide a separate ministry, with National Insurance as an integral part, and including the medical side of the Poor Law. Lord Rhondda assured the meeting that the Prime Minister was deeply interested in the proposal, and quoted Dr. Addison to the effect that his negotiations were

virtually completed, and that the bill would probably be introduced soon after Easter. Everybody, said Lord Rhondda, was agreed that, the difficulties having been surmounted, the bill should be introduced as quickly as possible. In the discussion which followed Major Waldorf Astor, Sir Robert Morant, and Dr. Alfred Cox took part. The general opinion was in favour of the bill so far as its terms had been revealed. The allied topic of reconstruction and the Poor Law was discussed by Sir Donald Maclean, chairman of the Local Government Board Committee which recently reported, and by Lord George Hamilton, a member of the same Committee. The indications at the present time would suggest that the Minister of Reconstruction has found a sufficient basis of agreement between the main parties affected to warrant the introduction of a Government bill for England and Wales, to amalgamate the Insurance Commission with the whole of the Local Government Board, leaving the non-medical functions of the latter department to be shed at a later date. It is not our desire "to pry into the secrets of the State," but this much seems to be common property.

Medical Notes in Parliament.

Tuberculous Soldiers.—In answer to Major Davies Sir A. Griffith-Boscawen said that colonies for tuberculous discharged soldiers were being established at various places in England, Scotland, and Wales, and arrangements were well in hand in connexion with colonies in Dorset (in which case application forms for admission had already been sent out), Cambridgeshire, Cheshire, and North Wales. The occupations in which training would be provided number about twelve, and included market gardening, pig keeping, poultry keeping, bee keeping, fruit culture, horticulture, forestry and rough carpentry, and smith work. Further proposals were under consideration for the establishment of colonies in Edinburgh, Northumberland, Durham, Norfolk, Suffolk, Worcestershire, and South Wales. As the need arose in other areas similar schemes would be considered. In reply to further questions, Sir A. Griffith-Boscawen said that the Ministry of Pensions had contributed in some cases a considerable sum towards the establishment of these farm colonies.

Training Centres for Discharged Soldiers and Sailors.—In reply to Sir W. Havelock-Allan, who called attention to a resolution of criticism passed by the Northern Counties Joint Disablement Committee, Sir A. Griffith-Boscawen said that in providing facilities for training disabled soldiers it was proper, as the need would probably exist for a few years only, to make use of existing institutions, and to arrange when necessary for their extension. If adequate provision could not be arranged otherwise, the creation of additional centres would be considered on their merits.

Poor Law Infirmaries.—In answer to Mr. Needham, Mr. Hayes Fisher said that every board of guardians either had at least one institution wherein the sick poor were medically treated, or had a settled arrangement for their treatment in an institution belonging to another board. There are ninety-five Poor Law infirmaries which had ordinarily one or more resident officers.

Glass for Eye Protection.—Sir J. T. Rees asked whether Mr. Charles Higgens, F.R.C.S., had by experiment established the fact that triplex glass, properly ground and treated, was a valuable protection to the eye from projectiles, splinters, stones, and such substances as were scattered broadcast by shell bursts, and did not itself splinter. Mr. Macpherson replied that some two years ago the question of substituting triplex glass for ordinary glass in spectacles for soldiers was considered, but it was decided not to adopt it in view of the expense involved, and of certain optical objections and difficulties in producing the enormous quantities of lenses required. Trials had also been made of visors fitted with these glasses, but they had not been recommended for adoption.

ON August 13th, 1917, the Cuban Junta Nacional de Sanidad passed a resolution in favour of legalizing cremation in all the cemeteries of the Republic, and the proposal has now received the sanction of Dr. Mendez Capote, Health Secretary.

M. J. GODART, until recently Under Secretary of State for Medical Services in the French War Office, has become the president of a French National Cancer League for the purpose of giving information to the public as to what is known with regard to the etiology of cancer and prosecuting further inquiries and research.

THE WAR.

LESIONS OF PERIPHERAL NERVES RESULTING FROM WAR INJURIES: PATHOLOGY AND TREATMENT.

A MEETING was held at the Alder Hey Orthopaedic Hospital on December 8th, 1917, to discuss this subject. The meeting was opened by Sir ROBERT JONES.

PATHOLOGY OF PERIPHERAL NERVE LESIONS.

Captain SYDNEY M. CONE gave a demonstration of the surgical pathology of peripheral nerve lesions, illustrated by lantern slides. The technique used was chiefly that described by him in the BRITISH MEDICAL JOURNAL, November 10th, 1917. In examining material removed during operations he had cut a very large number of sections from the central and distal ends and from surrounding tissue. Nerve fibres were demonstrated in the proximal end in 100 per cent., in the distal end in 95 per cent., between the two ends in 78 per cent., and in the surrounding adhesions in 80 per cent. In his view the hard tissue about the injured nerves and in the bulbous ends consisted of young nerves more than of fibrous tissue. In several cases he had found young nerves surrounding foreign materials, such as cloth; he had also found nerves growing in the meshes of a sheath of fascia lata which had been wrapped round a nerve junction.

THE DIAGNOSIS AND PROGNOSIS OF NERVE LESIONS.

Professor R. KENNEDY, after referring to the difficulty of diagnosis as to the exact nature of a nerve lesion from the clinical signs, emphasized the importance of obtaining an accurate history from the patient himself. He expressed the opinion that the determination of the nature of the lesion was more important from the point of view of prognosis than from that of treatment, for whether a nerve was anatomically divided or functionally interrupted by compression, the treatment in both cases was operative, although the possibility of doing good by the operation might be greater in the one than in the other. He quoted an interesting case of an unusual lesion which could scarcely have been diagnosed except by operation.

The patient presented a healed wound crossing the arm more or less transversely at the level of the insertion of the pectoralis major and extending over the anterior and inner aspects of the arm. The clinical diagnosis had been total paralysis of the ulnar nerve and partial paralysis of the median. At the operation what was taken to be the ulnar was readily exposed, and it was seen to be united by an extensive scar. The median, however, could not be found so easily, and it was soon apparent that what appeared to be the ulnar was in reality a composite nerve composed of the proximal end of the ulnar and the distal end of the median, while the proximal end of the median was found higher up ending in a large bulbous neuroma. At a lower level in the arm the distal end of the ulnar was found. It was, therefore, through the proximal end of the ulnar that the partial median function was being carried on.

Professor Kennedy called attention to certain circumstances which might have a considerable influence upon prognosis after operation: the existence, for example, of contractures in tendons and muscles and the amount of handling which the nature of the injury might have necessitated at the time of operation. The time which elapsed between injury and operation had an important bearing on prognosis. Investigation of this point had led him to take the view that if operation were performed at any time up to the third month from the date of the nerve section, recovery of movement would, everything being favourable, commence in about three months or a little more; but should five or six months pass before any operation was undertaken, then seven or eight months would probably elapse before there was any sign of recovery of motion. As the time between injury and operation increased, so the date of commencing recovery was advanced, so that when about a year or eighteen months had elapsed no motor recovery was likely to be shown for well over a year, or even two years. In his experience voluntary function was restored soon after contractions were obtainable to faradic stimulation. Nerve injuries met with in this war caused by lacerated wounds which had been infected and had healed after a considerable time, were found to give

results inferior to those of operations for nerve injuries caused by cuts with glass or knives which had not been seriously infected, for such nerve injuries as the latter were dealt with earlier and with less handling. Some years ago he had followed up and published a series of cases he had dealt with up to that date. He classified the results into three groups—as complete success, partial success, and failure. By complete success he meant recovery of sensation and motion with no interference by contractures sufficient to prevent a practically normal function of the limb. By failure he meant cases where no useful result had been attained; and by partial success cases where there had been useful recovery. Of 21 cases where the nerve had been completely severed, there were 10 complete successes, 7 partial successes, and 4 failures. In 14 cases where the nerve had been merely compressed 7 were complete successes and 7 partial successes.

Operative Treatment of Peripheral Nerve Lesions.

Sir Harold Stiles pointed out the great importance of a thoroughly practical knowledge of anatomy. He drew attention to many important points in the operative technique. Speaking of the disadvantages of the tourniquet, he said that the vessels often furnished a good guide to the nerve and its branches, whilst the tendency to oozing after the removal of the tourniquet made it necessary to spend much time over haemostasis. The necessity for using suitable instruments, for an adequately long incision for exposing a nerve above and below the lesion in the first instance, and for clean decisive cutting in place of scratching with the point of the knife, were insisted upon. He deprecated the protection of the wound from the adjacent skin, by clamping gauze to its cut edges, as unnecessarily encumbering the field of operation.

Treatment of the Nerve Lesion.

In dealing with the nerve lesion itself, attention was directed to the following points: if the lesion were complete, the bulbous or cicatricial extremities should be amputated with a very sharp knife, the nerve being meanwhile supported, and enough should be removed to expose the nerve bundles throughout the entire face of both stumps. If the nerve had not been completely divided, all cicatricial tissue should be removed from the sheath, after which the nerve should be carefully palpated to ascertain its degree of induration, and whether or not there were any cicatricial or gliomatous nodules in its substance. Next, the degree of excitability of the nerve to the faradic current should be ascertained, and while this was being done the limb should be carefully exposed distal to the lesion; the disinfection of the skin should, therefore, be continued down to its extremity.

If the nerve had been completely divided, the cicatricial or neuromatous stumps should not be amputated until all was ready for suture. If on stimulating the thickened or bulbous nerve it was found that the muscular response was fairly good, it was often advisable to incise the involved portion longitudinally in one or two places. If, on the other hand, the faradic response was feeble, an excision should be done, and enough removed to expose nerve fibres free from all scar or neuromatous tissue. In partial lesions of nerves no hard and fast rules could be laid down; each case must be judged on its merits. If in doubt excision should be performed provided that the operator was satisfied that the two stumps could be brought into apposition without tension after the whole of the damaged segment had been removed.

In suturing a nerve the finest linen thread was used. After suture a nerve should not be ensheathed either with a vein, fascia lata, or Cargile membrane, as these materials only served to promote the formation of cicatricial tissue. The best bed for the nerve was one consisting of fatty cellular tissue or healthy muscle.

Date of Operation.

Increased experience had convinced him that often the delay before operating was too long. Delay was justified if there were definite evidence that improvement was taking place; this was more likely to happen if the nerve had been contused as a result of a fracture, or if the symptoms were due to the pressure of callus. In such cases the improvement was progressive, and often ended in complete recovery. In cases, however, where the nerve had been directly injured by a missile, it was a mistake to wait, although the lesion might be only partial. Many of these partial lesions were attended with severe pain, with aggravated trophic disturbances, and cicatricial or reflex contractures. In such cases valuable time was wasted in waiting for a recovery which in the end was only very partial. If the wound had been healed for a few weeks, there was little fear of trouble arising from the lighting up of latent mischief. The operation could do no harm; the wound was healed in a fortnight, and the exploration enabled the surgeon to ascertain the exact nature of the lesion; the pain, the trophic changes, the reflex spasms, and the contractures often rapidly disappeared. In short, the operation would not only expedite the recovery, but at the same time render it more nearly complete.

The rest of the paper was devoted to injuries of individual nerves, and many important points in their anatomy and the technique of the operation were described.

Indications for Operation.

Captain T. P. McMurray spoke of his experience of over 300 cases. He had been led to make certain deductions regarding the indications for operation. The absence of faradic response several months after the injury was held to be a definite indication that there was serious impairment of function of a nerve following an injury in its neighbourhood. An exploratory operation, which in competent hands was entirely free from danger, should then be performed, and even if the nerve was merely freed from scar, marked improvement often followed. In his view a month should elapse between the healing of the wound and the operation.

Method of Operation.

Captain McMurray said that his operative technique approximated very closely to that of Sir Harold Stiles. The suture of nerves which had had to be approximated by flexion of joints led to the very interesting question as to the mode of subsequent lengthening which occurred when the limb was straightened. The slight amount of possible lengthening due to the slightly wavy position of the normal nerve had been taken up, and anatomists said that nerve tissue was quite unstretchable when weights were applied even for lengthy periods. It would seem, therefore, that the possible site for the stretching of a nerve was the line of suture, and that the elongation took place in the stretching out of the scar tissue between the two ends. Two facts, however, proved that this supposition was not true—first, the fact that these nerves recovered function even after having been let down from a position of extreme relaxation; and, secondly, a fact which he had noticed personally in six cases in which he had exposed the nerve for inspection several months after suture in flexion. In all these cases a narrow ring indicating where the suture had taken place was seen, and in no case was there an elongated scar which might have been due to the supposed stretching. All workers had found that the chances of recovery of a nerve after suture varied with the particular nerve divided. The best nerve of the upper limb was undoubtedly the musculo-spiral, while the median and ulnar nerves recovered with much less certainty, and their relative recovery was much slower. The reason assigned for this by many observers was the greater proportion of motor to sensory fibres in the musculo-spiral as compared with the median and ulnar nerves.

Blood Supply of Nerves.

In this connexion Captain McMurray expressed the opinion that the relation of the blood supply to the recovery of the nerves was a point of considerable importance. In regard to the blood channels of a nerve very little was known. When a large nerve such as the internal popliteal was found divided and sections were removed from each end down to normal healthy nerve tissue, it was found on arriving at this point that there was a central artery pumping blood from each end, and the deduction seemed to be that from the accompanying artery of the nerve which lay in its sheath, and from small blood vessels in the neighbourhood, tiny branches passed into the nerve between the fibres to a central vessel which coursed along the whole nerve and supplied it in its entirety. This artery he had demonstrated in the internal popliteal, external popliteal, and musculo-spiral nerves, but never in the median or ulnar, and it would seem that although

the blood system in these two nerves was similar to that in the other three, it was much smaller and therefore less likely to nourish young growing nerve tissue.

Captain McMurray preferred chromic catgut for suture material. He had found that after six months the line of suture made with chromic gut showed no sign of a foreign body and no roughness.

Injury without Division.

With regard to cases in which the nerve was injured and not divided, the question as to whether the site of injury should be exsected or not arose. In his experience, if a hard fibrous mass were present, functional recovery would not be obtained by simple freeing of the nerve. If, on the other hand, as so often happened, the bulbous enlargement was of the soft fibrous type, freeing the nerve and longitudinally splitting its sheath would be followed by restoration of function.

ACCESSORY AND SPECIAL TREATMENT IN RELATION TO PERIPHERAL NERVE LESIONS.

Captain W. ROWLEY BRISTOW began by saying that no kind of after-treatment could make up for operative imperfections. His belief was that neither the time taken for regeneration of the nerve fibres, nor the completeness of the progress, could be affected to any appreciable extent, and questioned the statement of Tinel that the regeneration of a nerve appeared to be hastened by the simple passing of the electric current. The value of accessory treatment was to prepare the parts against the time when regeneration would take place, and the nerve reacquire its power of conduction.

Accessory treatment was (1) postural, and (2) treatment directed towards assisting nutrition. The former consisted in efficient splintage so as to secure the relaxed position for paralysed muscles. The second embraced heat, massage, electrical treatment, gymnasium and workshop.

Heat must be the preliminary to either massage or electrical stimulation, as muscle contracted better when the part was warm. Moist heat was better than dry before electrical treatment was used, because the moisture lessened the resistance of the skin to the current. Apart from the matter of moisture, no one form of heat was better than any other. In irritative nerve lesions heat usually increased the pain, and was contraindicated.

Massage was useful mainly to increase nutrition in the paralysed part, but it was also of great value if oedema was present. In such cases massage should precede electrical stimulation of the muscles, because, if there were much oedema, the resistance to the passage of the current was so great as to prevent penetration. This point must also be remembered in testing electrical reactions for diagnostic purposes.

The electrical treatment for the paralysed muscles consisted in stimulation with the interrupted galvanic current, this being the only form of electrical stimulus which would promote contraction in the presence of a lesion of a nerve. He did not consider that there was any value in electricity except as a stimulus. In his practice each muscle was made to contract some six or eight times, the treatment being carried out daily. In the early stages it was better to do too little than too much, as fatigue was easily induced. In cases in which there was no oedema, massage could be dispensed with. With return of faradic excitability both currents were employed; the muscle did not regenerate all at once, and if only the faradic current were used some fibres only would be exercised. With full return of faradic excitability the galvanic stimulation was given up, because the graduated contraction method of employing the faradic current simulated physiological contraction more closely and was to be preferred for this reason. The relative time for recovery of faradic response and voluntary power varied. In his experience faradic response was usually the first to recover, but this was not constant. It was only a question of skin resistance, for in all cases in which the exposed nerve was stimulated at operation, if the lesion were incomplete or if regeneration were well advanced, faradic response occurred before any voluntary power could be obtained.

Re-education was a most important part of after-treatment. He endeavoured to initiate and encourage voluntary movement from the earliest stages. The masseuse spent some time immediately following the electrical stimulation in trying to induce the patient to reproduce voluntarily the action which she had provoked electrically. When a weak and newly recovered muscle was being asked to do voluntary work it should be put into the most advantageous position, and not asked to overcome the force of gravity in addition to moving the part. The value of the gymnasium and of the curative workshop lay in the general effect upon the patient rather than in their local effect upon the injured part. Great harm might be done to recovering muscles by overwork. In hospitals with several departments for after-treatment there was a risk of patients getting too much rather than too little in the way of physiotherapy.

In *causalgia* none of the remedial measures were of any value, and the same might be said for the less severe irritative lesions. Nerves involved in scar tissue, and tender from this cause, were not relieved either by diathermy or ionization.

STATISTICS.

Captain C. B. ALEXANDER gave some statistics regarding cases treated at the Alder Hey Military Orthopaedic Hospital between January, 1915, and December, 1917. During this period 876 cases had been treated—644 were complete lesions and 232 partial.

Relative Frequency of Involvement of Individual Nerves.

Ulnar	...	265	or approximately	30 per cent.
Median ...	...	179	" "	20 "
Musculo-spiral	...	122	" "	15 "
External popliteal	...	90	" "	10 "
Sciatic ...	...	48	" "	6 "
Brachial plexus	...	36	" "	4 "
Internal popliteal	...	26	" "	3 "
Radial ...	...	23	" "	25 "
Posterior interosseous		22	" "	25 "
Anterior tibial	...	18	" "	2 "
Posterior tibial	...	17	" "	2 "
Circumflex ...	...	11	" "	1 "
Musculo-cutaneous	...	12	" "	1 "
Anterior crural	...	7	" "	1 "

Of the 36 cases of injury to the brachial plexus the whole plexus was involved in 11, and of the remainder the outer and posterior cords were injured more frequently than the inner—the proportion of 4 to 1. Of the 265 cases of injury to the ulnar the median was also involved in 58, the musculo-spiral in 8, and posterior interosseous in 2. The site of injury to the ulnar nerve was in forearm and wrist 44 per cent., in the upper arm 31 per cent., and about the elbow 24 per cent. Of the 179 cases of median nerve injury 58 were associated with lesions of the ulnar, 7 with musculo-spiral, and 2 with the musculo-cutaneous. The musculo-spiral nerve came third on the list with 122 cases. In 45.7 per cent. the nerve was damaged in the lower third of the arm, in 31.1 per cent. in the middle third, and in 9.8 per cent. in the upper third; 59 per cent. of all injuries of the musculo-spiral were associated with damage to the humerus. Of the large nerves of the upper limb, the musculo-spiral was least frequently associated with lesions of other nerves and most frequently with fracture. This led to the conclusion that the fracture and not the projectile was, in the majority of cases, responsible for the injury.

In the lower limb the trunk of the great sciatic nerve was involved 48 times, and of this number 25 were lesions of both its constituent parts. In 18 the external half only was concerned, and in 5 the internal half. Of the branches of the great sciatic, the external popliteal was involved in 90 cases and the internal in 26. The exposed position of the external popliteal, as it winds round the fibula, no doubt helped to account for the high relative frequency of its injury, but in wounds of the upper part of the thigh it was difficult to explain why the external half of the sciatic was so much more often damaged than the internal half. Makins had written:

> The most striking observation with regard to injuries of the great sciatic nerve was the comparatively frequent escape of the popliteal element and the severe lesion of the peroneal. This was so pronounced as to amount to as high a proportion of peroneal symptoms as 90 per cent., and often when the whole nerve was implicated the popliteal signs were of the irritative (or partial) and the peroneal of the paralytic type.

During the period under review 474 operations upon peripheral nerves had been performed, of which 298 were sutures and 176 neurolyses.

Captain Alexander pointed out the difficulties of examining and estimating the results of these operations, and indicated the methods adopted by him in following up the cases for as long as possible. He had been able to trace for a sufficiently long period 260 cases, and the results were analysed as follows:

A. Those which were sutured.
B. Those in which neurolysis was performed.
C. Those in which operative interference was not thought necessary, or operation was not performed for some other reason, for example, sepsis, and which received only electrical treatment, corrective splinting and massage.

Class A (sutures), forming 40 per cent. of the total, shows 14 per cent. of complete recoveries over periods varying from six months to two years, partial recoveries 21 per cent., and no change 64 per cent.

Class B (neurolysis), forming 27 per cent. of the total, shows 14 per cent. of complete recoveries, partial recoveries 40 per cent., and no change 46 per cent.

Class C (no operation), forming 32 per cent. of the total, shows 18 per cent. of complete recoveries, partial recoveries 43 per cent., and no change 38 per cent.

By complete recovery was meant complete return of voluntary power; by partial recovery some return of voluntary power, with or without reaction to faradism, and with return of protopathic sensation.

Of the nerves of the upper limb which had been sutured the ulnar showed 13 per cent. partial recoveries and 3 per cent. complete recoveries, the median 23 per cent. partial recoveries and 38 per cent. complete recoveries, and the musculo-spiral 25 per cent. partial recoveries and 16 per cent. complete recoveries.

When neurolysis had been performed the ulnar showed partial recovery in 28 per cent. of cases, the median 31 per cent. partial recoveries and 15 per cent. complete recoveries, and the musculo-spiral 22 per cent. partial and 44 per cent. complete recoveries. In the lower limb the sciatic and its branches showed partial recovery after suture in 28 per cent. of cases and complete recovery in 7 per cent. Of the cases of neurolysis 62 per cent. showed partial recovery and 14 per cent. total recovery. Of the cases which had not been operated upon 44 per cent. showed partial recovery and 5 per cent. total recovery.

(To be continued.)

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Accidentally Killed.

CAPTAIN P. LEVICK, R.A.M.C.

Captain Percy Levick, R.A.M.C., was accidentally killed in France recently, owing to his horse slipping and falling, and throwing him beneath a motor lorry. He was educated at King's College Hospital, and at Cambridge, where he graduated B.A. in 1895, and M.B. and B.C. in 1898. After filling the posts of house-surgeon and of clinical aural assistant at King's College Hospital, he went into practice at Guildford, where he was honorary medical officer of the Royal Surrey County Hospital. He had served as medical examiner of recruits at Guildford prior to taking a temporary commission in the R.A.M.C.

Killed in Action.

Captain StC. Dunn, C.A.M.C.

Died on Service.

LIEUTENANT G. G. C. ADAMS.

Lieutenant George Gordon Crymble Adams, R.A.M.C., was reported as having died on service in the casualty list published on March 25th. He took the diplomas of L.R.C.P. and S.I. in 1917, and joined the army soon after.

DR. A. K. BAXTER.

Dr. Alexander Kidd Baxter died of typhus at Wei-hai-wei on March 14th, aged 50. He was the fifth son of the late David Baxter, of Leith, and was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1902. After acting as house-surgeon of Tiverton Infirmary, he went out to China as a medical missionary of the United Methodist Mission, and was for long stationed at Chu Chia Chai, Shantung, North China, in charge of the Yung Ping Fu Mission Hospital. For the past year he had been serving under the War Office as medical officer of the coolie labour camp at Wei-hai-wei.

Wounded.

Captain H. C. Colver, R.A.M.C. (temporary).
Captain W. J. Phillips, M.C., Australian A.M.C.
Captain F. W. White, R.A.M.C. (temporary).

DEATHS OF SONS OF MEDICAL MEN.

Emmett, Cyril William, Flight Sub-Lieutenant R.N., youngest son of Dr. Richard Emmett, of Winton, Portsmouth, killed March 15th, aged 19. He was educated at Repton, entered the Royal Naval Air Service in May, 1917, and went overseas on January 16th last.

Knowling, Francis John Dobrée, M.C., Captain Argyll and Sutherland Highlanders, younger son of Dr. E. M. Knowling, of Tenby, South Wales, killed March 8th, aged 26. He was educated at Cheltenham College, and was an agricultural student when, at the beginning of the war, he enlisted in the Shropshire Light Infantry. He got a commission in the Argyll and Sutherland Highlanders on September 22nd, 1914, became lieutenant on May 7th, 1915, and captain in September, 1915. He went to France in May, 1915, served at Loos, received the Military Cross in June, 1916, was subsequently wounded, and returned to the front last January.

Muspratt, Keith Knox, M.C., Second Lieutenant Dorsetshire Regiment, attached Royal Flying Corps, youngest son of Dr. Charles D. Muspratt, of Bournemouth, killed in a flying accident in East Anglia on March 16th, aged 20. He was educated at Sherborne, got his commission in August, 1916, joined the Royal Flying Corps in November, 1916, and gained the Military Cross in September, 1917.

Stephenson, John, Lieutenant Royal Naval Reserve, younger son of the late Dr. Leader H. Stephenson, reported missing August 13th, 1917, now presumed killed on that date by enemy action, aged 34.

Veraguth, Guy Frank, Lieutenant Royal Field Artillery, only son of the late Dr. C. Veraguth, of Cannes, died in the military hospital at Bristol, of pneumonia following malaria, on March 18th, aged 20. He entered the Royal Military Academy, Woolwich, in February, 1916, passed out first in the same year, and joined the R.F.A. in November, 1916. He had been serving with the Salonica Force in the operations on the Struma river.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

A SUPPLEMENT to the *London Gazette*, published on March 22nd, gave statements of the services for which the decorations announced in the *London Gazette* of November 19th, 1917 (BRITISH MEDICAL JOURNAL, November 24th, 1917, p. 702), were conferred. The following officers of the medical services received the awards indicated "for conspicuous gallantry and devotion to duty":

Distinguished Service Order.

Major Sydney Vere Appleyard, A.A.M.C.

He established a forward dressing station immediately in rear of the front line during an attack, and attended continuously to the wounded, frequently going out and dressing cases in the open under heavy shell fire. His dressing station was hit by a shell, and, though he was badly shaken, he continued his work with great determination and devotion to duty. His fearlessness was an inspiration to all, and was the means of saving many lives.

Major William Wallace Stewart Johnston, M.C., A.A.M.C.

While the enemy were shelling very heavily the positions where assaulting troops were assembled he went out into the open with an absolute disregard of personal safety and attended to the wounded where they lay. After the attack was launched he continued to work for several hours under a very heavy enemy barrage until severely wounded. On many previous occasions his fearlessness and devotion to duty while acting as regimental medical officer have been most conspicuous.

Temporary Captain Gordon Wilson Armstrong, R.A.M.C.

He worked in the open under continuous and heavy shell fire, and dressed and evacuated 117 stretcher cases from his aid post in twenty-seven hours. Later on, while the shelling was very severe, he volunteered to go in aid of an officer and an orderly, carrying them to the aid post one after another on his back. Though wounded during the second journey, he refused to leave his post, remaining with his battalion until it was relieved.

Bar to the Military Cross.

Captain William McMeekin Chesney, M.C., R.A.M.C.(S.R.)

When in charge of stretcher-bearers he continually visited the forward aid posts throughout the day, and supervised the evacuation of the wounded under very heavy shell and machine-gun fire. Though wounded he refused to quit his post until he had rendered a valuable report on the evacuation of the wounded. He worked with indefatigable energy and great courage throughout.

Temporary Captain Robert Welton Hogg, M.C., R.A.M.C.

While in charge of the forward bearer post he worked indefatigably for three days, evacuating the wounded from the regimental aid posts in the line, moving about continuously under heavy enemy barrages. It was entirely due to his fine example and untiring energy that over 200 stretcher cases were safely got away from the front during the first six hours of the attack.

Temporary Captain Maurice Bertram Lawrie, M.C., S.A.M.C.
He established a collecting post in an advanced position, and when his post was filled with wounded he continued to dress cases in the open, though fully exposed to shell fire. In order to satisfy himself that all the wounded had been brought in, he personally searched the whole of the brigade front.

Temporary Captain Hubert Francis Wilson, M.C., R.A.M.C.
He established his regimental aid post in a shell hole close to the firing line, and maintained it in spite of heavy shell fire. During an attack he went forward under heavy fire and attended to the wounded who could not be brought in by the stretcher-bearers. His devotion to duty and unceasing energy is deserving of the highest praise.

Military Cross.

Captain Bernard Gordon Beveridge, R.A.M.C.
He was in charge of a divisional collecting post and relay bearer posts during an action, and organized and carried out the evacuation of the wounded over the open under continuous fire. It was only by his unfailing courage and energy that the work was successfully accomplished.

Captain Vernon Carlisle Brown, A.A.M.C.
When the officer in charge of an advanced post and a stretcher-bearer were wounded he attended to them under a heavy bombardment and assisted in carrying them to a place of safety. He showed great courage and coolness.

Temporary Captain Dimock Stanley Cassidy, R.A.M.C.
When a party of men were gassed in a mine shaft he went down and remained there all night preparing to render first aid. He did not leave his post even when seriously affected by gas.

Captain George Eustace, R.A.M.C.
He was going forward with a party which came under a very heavy barrage. He remained out in the barrage attending to the wounded regardless of danger, and carried one wounded man several hundred yards through the barrage to safety.

Captain Frederick George Harper, R.A.M.C.
He worked incessantly, attending to the wounded under heavy shell fire. He set a magnificent example to all, and undoubtedly saved many lives.

Temporary Captain James Jack, R.A.M.C.
He established forward collecting posts and dressed and removed the wounded with great coolness and disregard of danger during a period of four days and nights. Most of the time he was under heavy shell fire, and set a fine example of courage to his men.

Captain Charles Hallily Kellaway, A.A.M.C.
For twenty-four hours following the attack he worked without a moment's respite, dealing with the wounded of five battalions in addition to his own, and at the same time controlling the work of his stretcher-bearers.

Captain Harold Howard Leeson, R.A.M.C.
He showed the utmost courage and total disregard for personal safety when commanding stretcher-bearer squads. His splendid example under heavy shell fire inspired those working under him.

Captain James Stewart McConnachie, R.A.M.C.
He was in charge of a divisional collecting post during an attack, and organized and carried out the evacuation of the wounded under heavy fire, in the course of which his post was several times hit. He carried on his work during several counter-attacks by the enemy, and set a splendid example of coolness and courage.

Temporary Captain Charles Fellowes Maclachlan, R.A.M.C.
He worked continuously for forty-eight hours under heavy shell fire, attending to the wounded, much of his work being done in the open. His services were of the greatest value, and he set a magnificent example to all.

Temporary Captain Peter Malcolm MacLachlan, R.A.M.C.
During an attack, as soon as the battalion captured its objective, he went to the front line under heavy shell fire to bring back the wounded. He did excellent work under heavy fire throughout the operations, and showed great gallantry and disregard of danger.

Captain Patrick Joseph Francis O'Shea, A.A.M.C.
While in charge of stretcher-bearers he displayed the utmost courage and devotion under heavy shell fire. His fine example was largely responsible for the maintaining of the lines of evacuation from the front line to the head quarters.

Temporary Captain Alexander Waugh Young, R.A.M.C.
He worked untiringly in attending to the wounded, continually going out into the most forward area under heavy machine-gun fire with his men, encouraging and directing them in their work. It was due to him that nearly 200 cases were evacuated from the line.

Quartermaster and honorary Lieutenant Francis Poole, R.A.M.C.
He remained at the advanced collecting station for several days organizing the rationing of the wounded, and daily visited the relay posts and regimental aid posts with supplies of medical comforts and dressings. During heavy shelling he helped to withdraw the wounded, and lives were saved by his action and example. He has continuously done excellent work.

The King of Italy has conferred the decoration of Cavalier of the Order of the Crown of Italy upon acting Lieut.-Colonel E. F. Eliot, R.A.M.C., and temporary Captain R. H. Lucas, M.C., R.A.M.C.

NOTES.

CANADIAN MILITARY LABORATORY.

A NOTE in the *Bulletin of the Canadian Army Medical Corps* (No. I, March, 1918) states that steps were taken at the end of last year to improve the organization of Canadian military laboratories, by subdividing the work and making special arrangements for the training of reinforcing personnel. The laboratories have been divided into four classes: Class A (central laboratories), to deal with all kinds of pathological and public health work. Class B, Hospital laboratories dealing with general clinical pathological work, including Wassermann tests and tissue sections. They will not deal with sewage or water examination, or other strictly public health laboratory work. Class C, Hospital laboratories dealing with such clinical pathological work as analysis and examination of blood, sputum, stomach contents, urine and faeces, throat cultures and other simple culture work. Class D, Hospital laboratories dealing with haematological and urinary examination and analysis.

It has been decided to use No. 1 Canadian General Laboratory at Folkestone for the training of officers in routine pathological work. Officers and other ranks selected to reinforce personnel for laboratory work, after finishing their regular course of training at the C.A.M.C. dépôt, will be sent to the Folkestone laboratory. The officer commanding it has been given a supervising position in regard to the other laboratories. Each laboratory is equipped for its particular work and he will be responsible for its upkeep. He will also make suggestions regarding standardization of methods of collection and dispatch of specimens, methods of tests and analysis, and methods of recording and reporting. One result of the new arrangements will be that it will no longer be necessary to have fully equipped laboratories attached to all the smaller hospitals. Work sent to a particular laboratory which does not fall within its scope will be transferred to another laboratory authorized for such work. Care has been taken that the organization shall not limit the pathologist as regards research, and any special materials he may need for such work will be granted.

VENEREAL DISEASES.

Defence of the Realm Regulation.

The following new regulation under the Defence of the Realm Act has been issued: No woman who is suffering from venereal disease in a communicable form shall have sexual intercourse with any member of His Majesty's forces or solicit or invite any member of His Majesty's forces to have sexual intercourse with her. If any woman acts in contravention of this regulation she shall be guilty of a summary offence against these regulations. A woman charged with an offence under this regulation shall, if she so requires, be remanded for a period (not less than a week) for the purpose of such medical examination as may be requisite for ascertaining whether she is suffering from such a disease as aforesaid. The defendant shall be informed of her right to be remanded as aforesaid and that she may be examined by her own doctor or by the medical officer of the prison.

MEDICAL ARRANGEMENTS IN THE ITALIAN ARMY.

Dr. Victor G. Heiser, a member of the American Red Cross Commission to Italy, in a paper read before the Philadelphia College of Physicians on January 2nd (*New York Medical Record*, January 19th), said that the Italians had provided approximately 1,000,000 hospital beds for an army of 4,000,000. There were seven principal units: advanced dressing stations; dispensaries, one or two kilometres behind the front; mountain ambulances from two to five kilometres behind the front, and somewhat larger and better equipped stations further back; mobile hospitals of 100 beds, the whole equipment of which could be transported on five motor trucks and three touring cars; field hospitals with 500 beds, used as distributing centres; base hospitals, providing 20,000 to 40,000 beds, several hundred kilometres behind the lines; and reserve hospitals, in various cities. Each army had a number of large quarantine stations provided with steam disinfecting apparatus or sulphur dioxide chambers; every patient before admission to a general hospital and all prisoners were passed through one of these stations. Hospitals were being located increasingly nearer the front and in very unusual places. Thirty or forty feet underground and directly under a point where a battle was raging, it was a novel experience, said Heiser, to see the hospital routine in good operating rooms and wards provided with artificial ventilation and modern equipment. In another place there was a hospital with 30 beds hewn out of the side of a cliff at an elevation of 6,000 feet in the Dolomites. Practically every hospital had one or more *x*-ray machines, all manufactured in Italy. The hospital train service worked smoothly. Great progress has been made in methods for the re-education of lost functions. Quarantine stations have been established for malarious soldiers invalided from Salonica and Albania, who, it is estimated, already number 100,000. A comparatively small amount of tuberculosis has been met with in the Italian army, but 30,000 tuberculous Italian prisoners have been returned from Austria. No official records of venereal diseases were available, but these scourges are said to have been reduced to almost negligible proportions.

X-RAY ORGANIZATION IN THE UNITED STATES ARMY.

As soon as America entered the war the matter of *x*-ray facilities and personnel engaged the attention of the Surgeon-General, and steps were taken to provide the necessary men and equipment. A committee on preparedness was appointed by Dr. Cole, president of the American Roentgen Ray Society, and this committee, together with representatives of other Roentgen societies, in consultation with officers of the United

States army, undertook the work of organizing proper instruction, making a canvass of suitable men, assisting in the design of standard apparatus, and securing a suitable manual for army work. A teaching staff was appointed, with the approval and co-operation of the army medical chiefs, to teach practical roentgenology to officers of the army medical reserve corps. This staff (*American Journal of Roentgenology*, vol. iv, No. 11) consists of roentgenologists in nine large cities in various parts of the States, from New York to Los Angeles. Up to the end of 1917 about 200 had been instructed; but it is estimated that between 600 and 800 will be needed, all of whom will be given a course of ten weeks. The hospital schools and clinics have freely given facilities for clinical work in the various cities where instruction is carried on; although the members of the staff of instruction are widely separated geographically, they are kept in touch with each other so as to secure some degree of unity in training. Provision is also made at the New York centre of instruction, Cornell Medical College, for medical officers of the navy; and an effort is being made to standardize roentgenological equipment in all naval hospitals and ships. The committee has also assisted in the development of the portable field outfit previously mentioned.

Scotland.

THE SYMPATHETIC AND PARASYMPATHETIC SYSTEMS.*

The Parasympathetic System.

IN continuing his course of Morison Lectures, Dr. J. J. Graham Brown said that, like the sympathetic, the parasympathetic system was influenced by impulses reaching it from higher centres. The anatomical course and functions of the efferents originating in mid-brain, medulla, and sacral cord were described in detail. Throughout both systems there were many beautiful examples of reciprocal innervation, as where parasympathetic fibres running with the third nerve were motor to the sphincter of the iris, and at the same time inhibited the dilator. Fibres passed in the pars intermedia of Wrisberg to the palate and lacrymal glands, and thus tears might flow not only from emotion (sympathetic) but as a local protective mechanism (parasympathetic). The nerve supply to the salivary glands and other parasympathetic neurones from the medulla were also described. Individuals with high parasympathetic tone had rather copious saliva. Anything which stimulated the system would cause salivation. Other exciting causes were local pain and the psychic or sensory appreciation of food; the flow was arrested by paralyses affecting the neurones, by atropine, distaste for food offered, and by strong emotion (sympathetic dominant).

It was characteristic of the parasympathetic system that the medullated nerve ran straight to its destination, and the synapse was with cells of the local plexus. The vagus sent fibres to such plexuses in the heart, arteries, bronchial musculature, oesophagus, stomach, small intestine, pancreas, gall bladder, and bile duct; its action in relation to each of these was described. Fibres from the sacral cord came from the second and third segments, and were motor to the colon, rectum, and bladder, except the trigone (sympathetic). They inhibited the vesical, urethral, and internal anal sphincters, and dilated the vessels of the erectile tissue.

The parasympathetic protected the individual organs from overstrain and influenced the nutrition of the body and the sexual activities. For the eye it was protective against light, eyestrain, and dust. Through the vagus it saved the heart by inhibiting its rate and strength and diminishing excitability, and by its vaso-dilator action lowering blood pressure. Similarly the lungs were guarded against overdistension by the inhibition of inspiration, against foreign substances by coughing, and against noxious gases by bronchial contraction. An example of this last action carried too far was seen in "gassed" cases, and in such the fear of sleep (parasympathetic dominant) and a resulting spasm of dyspnoea were similarly explained. Again, many parasympathetic symptoms were evidenced during violent coughing. In the alimentary canal the parasympathetic was motor to the muscle wall, inhibitor to the sphincters, and also secretory to the stomach. Thus it provided against overdistension, and ridded the intestine of irritating material, while distension of the rectum and bladder was the reflex for defaecation and micturition.

The system subserved the nutrition of the body in three ways—by promoting digestion and assimilation, by removal of excretory products, and by certain general effects on metabolism. The immediate cause of hunger was a contraction of the stomach wall by parasympathetic neurones and the production of saliva and gastric juice; pancreatic juice, bile, and probably intestinal juice were to some extent secreted under its influence. It removed excreta by its tendency to cause emptying of the intestine and bladder. There was an increased carbohydrate tolerance, no alimentary glycosuria being obtained even with 300 grams of glucose, the effects of pilocarpine administration were marked, and the blood showed a tendency to eosinophilia. As the sympathetic was stimulated by adrenalin it was natural to ask if a corresponding hormone existed for the maintenance of parasympathetic tone, and certain homocholenes derived from the cholene of the tissues appeared to act in this way. Special adequate stimuli were certain emotions, such as hunger, anxiety, sexual excitement; irritation either local or reflexly from a distance (for example, gastric hyperacidity from appendicular catarrh or gall bladder irritation), and distension of organs.

Parasympathetic hypertonus was seen not only in individuals with an inborn peculiarity of constitution, but whenever the sympathetic was unduly depressed, or the parasympathetic stimulated by drugs or toxins.

Men showed a constitutional hypertonus oftener than women, and these tended to exhibit a masculine type. A typical picture was of an individual, thick-set, stout (unless emaciated from dyspepsia), eyes, hair, and complexion dark, pupils small, palpebral fissure narrow, features strongly marked and coarse, and nose and lips full. The brow was broad, the face often tapering towards the chin; the skin sallow, thick, greasy. Acne was often present, and dermographia. The palms and soles were often moist, the fingers cold and livid, and there was a tendency to mental depression. Saliva was copious, the palatal reflex might be absent. There were gastric and intestinal symptoms, and sexual hyperexcitability. Sugar tolerance was high. There was a tendency to eosinophilia, and the individual reacted strongly to pilocarpine.

Hypertonus from depression of the sympathetic was seen during sleep, and then contractions of the bronchial, intestinal, and uterine muscle were most likely to occur from the dominance of parasympathic innervation. It was seen also in Addison's disease and in myxoedema.

Of the drugs which produce hypertonus the muscarine group formed the chief, while pilocarpine was the most important clinically. The lecturer here put forward the view that the sweat glands, like the lacrymal and salivary, have a double innervation—the sympathetic action associated with fear, the parasympathetic with the protection of the body; probably the sweating of fever was an example of this. Physostigmine, like pilocarpine, was useful where there was diminished tone, and was also laxative by stimulating peristalsis. The parasympathetic was stimulated by the bile salts, also by alcohol in small doses, while long-continued excess paralysed the system.

The serious symptoms from hypertonus were due to intestinal toxins, especially seen in ileal stasis; these toxins belonged to the diamines, the best known being histamine (β-iminazolyl-ethylamine) formed by bacteria of the typhoid-coli group. Dr. Graham Brown referred to the likeness which had been noted between this condition and anaphylactic shock, and suggested that this latter should be specially guarded against in individuals showing parasympathetic overtone.

Given the constitutional tendency and toxic action many circulatory and alimentary troubles might follow—bradycardia, chilblains, asthma; gastric hyperacidity and pain returning even after gastro-enterostomy; there might be diarrhoea of anxiety, but more usually there was intestinal stasis, or mucous colitis caused by a spasm of the colon, analogous to asthma (in both Charcot-Leyden crystals are found and there is eosinophilia). Treatment should be directed to limiting intestinal putrefaction, to stimulating the sympathetic by thyroid and the iodides as adrenalin was so evanescent, and by camphor for the heart, and to paralysing the parasympathetic by drugs such as belladonna, hyoscyamus, stramonium Atropine had the most complete effect, but its action in intestinal spasm depended on the cause; if due to hypertonus it reduced, if the tone was low it augmented, the

* Concluded from p. 357

local reflex; hence it might help some forms of constipation, and was useful in diagnosis. Opium and its alkaloids were also used. The phenanthrene group, morphine and codeine, in small doses, stimulated the sympathetic; for example, the stomach wall was relaxed, and that was pyloric spasm. Similarly the isoquinolene group paralysed the parasympathetic. Of this group papaverine was useful; it had no noticeable narcotic effect, and could be given in doses of ½ to 1 grain.

Examples of treatment were given, as asthma by hypodermic adrenalin or by atropine, stramonium, papaverine, and, in chronic cases, the iodides; "gassed cases" by atropine, adrenalin, iodides, and oxygen; and mucous colitis by papaverine, and adrenalin by the bowel. At various points the lecturer gave details of many interesting cases with the treatment applicable, and throughout the course his remarks were finely illustrated by lantern slide and diagram.

Ireland.

PARLIAMENTARY REPRESENTATION OF QUEEN'S UNIVERSITY, BELFAST.

Candidature of Sir William Whitla.

AT a meeting of the medical graduates of Queen's University, held in the Medical Institute, Belfast, on March 19th, when Dr. William Donnan, President of the Ulster Medical Society, was in the chair, the following resolution was unanimously adopted:

> That the importance of the Medical School of Queen's University, Belfast, and the number of graduates in the Medical Faculty give the Medical School a very strong claim to provide the representative of the University in Parliament, and that at a time like the present, when matters of public health and of medical attendance on the working classes are claiming and are likely to receive a large amount of attention in Parliament, it is most important that the medical profession should be adequately represented in the House of Commons, an end which may most suitably be attained by the sending forward of medical representatives from this and other universities—representatives who will be untrammelled by the ordinary ties of party, and who will consequently be able to give expert and unprejudiced advice on such matters to the benefit alike of the country, of the profession, and of this university.

In moving this resolution, Mr. R. J. Johnstone, F.R.C.S.Eng., said that the medical profession was handicapped by the limited number of medical men, all of them party men, who were members of the House of Commons. A university representative would not be bound by the party caucus and would be able to speak with special knowledge as to the many medical matters that would arise in the future. In seconding the resolution, Dr. R. W. Leslie said that the medical faculty was the largest in the university, the total fees being more than double those of the other faculties combined. He hoped his colleagues on the senate would look upon the proposal to choose a medical representative with sympathy, for the interests of the medical faculty were not antagonistic to those of the other faculties. The question of primary education, for example, was of great importance to the medical profession, and in fact medical interests were those of the community at large. The resolution was supported by Surgeon T. S. Kirk, also a member of the senate, who observed that the university did not receive sufficient financial support from the city.

This resolution having been carried unanimously, Dr. John Campbell proposed that Sir William Whitla should be adopted as the candidate. He referred to Sir William Whitla's long and honourable connexion with the university, which he represented on the General Medical Council, to his world-wide reputation, to his interest in general politics and the local politics of Ulster, to his diligence as a member of the Irish Convention, to his popularity, not only with the Irish, but with the English and Scottish electors, and to his active interest in education in all branches. The most important reason, he said, for adopting Sir William Whitla was that he was in a position to devote his whole time to his parliamentary duties, and was ready even to give up his professorial chair, if necessary. In seconding the resolution, Dr. Gardner Robb observed that health problems would be most pressing in the immediate future. The ideal was to have a representative in the House of Commons who understood the teaching side, had a knowledge of medical work from the experience of general practice, and a sympathetic understanding of industrial problems. The resolution was supported by Lieut.-Colonel A. B. Mitchell, and passed unanimously. Professor James A. Lindsay then read a memorial asking Sir William Whitla to permit himself to be nominated, and proposed that the signatories to it should be members of a joint committee for the promotion of his election. The proposal was seconded by Dr. F. C. Mann (Dungannon) and unanimously approved.

Our correspondent in Belfast states that the feeling in that city in favour of returning a medical man to represent the Queen's University in Ireland is very strong. The large and flourishing medical school has been for over sixty years the mainstay and backbone first of the old Queen's College from its foundation, and later of the Queen's University. But for the success of the medical faculty it is doubtful whether the university would have come into existence. It is particularly desired that the representative shall be a man of science, preferably a medical man, able to join in the forward movement of educational reform and to appreciate the great medical changes of all kinds that are imminent.

Correspondence.

THROMBOSIS AND EMBOLISM.

SIR, — The very interesting article by Mr. Charters Symonds in your issue of March 23rd, in which he draws attention to the positions of the patient in favouring thrombosis after operation, encourages me to offer, in support of his inference, my own opinion on a like subject; namely, in patients recovering from long illnesses, such especially as typhoid fever. My pupils will remember that for many years I have taught, and incidentally have published, the opinion that in such cases we meet with two kinds of thrombosis: first, that directly due to the septic element of the disease, and this may occur early in its course, as in pneumonia; secondly, that described by Mr. Symonds as occurring during convalescence. This latter kind I have attributed to the recovering strength of the patient, who finds at last he can throw one leg over the other, and even turn to sleep on his side. For many years I have impressed upon nurses and patients the duty, as the strength is restored, of avoiding all positions of pressure on a limb.—I am, etc.,

Cambridge, March 25th. CLIFFORD ALLBUTT.

PARALYSIS FOLLOWING ARTERIAL INJURIES.

SIR,—It is remarkable that a kind of intermittent claudication of extremities (as described by Charcot and others) should be such a frequent and striking symptom in limbs (usually one or both lower limbs) affected by "thrombo-angiitis obliterans," whereas in cases of paralysis of traumatic vascular origin, such as the ischaemic cases of traumatic "angiotic" paralysis of extremities, recently described in the BRITISH MEDICAL JOURNAL (1918, i, p. 199) by Captain Harold Burrows, the symptom in question should be absent, or only present in the clinical background.

Another well-marked difference in the symptomatology of the two groups of cases is the absence in thrombo-angiitis obliterans of the typical anaesthesia or hypo-aesthesia of stocking-like or glove-like distribution, which constitutes so noticeable a feature in the traumatic (ischaemic) cases described by Captain Burrows. I believe that after more or less complete recovery in traumatic cases one curious symptom may sometimes be observed—namely, a greater tendency to muscular cramp in the limb that has been injured than in its fellow. This was so in the case of a man, aged 41 years, whose case I described in an article on "Muscular Cramp" (*American Journal of the Medical Sciences*, May, 1894). The patient, in 1889, had apparently had his left common iliac artery obliterated by a traumatism, and was an in-patient, under Sir William Savory, at St. Bartholomew's Hospital, when I was house-surgeon. Cutaneous anaesthesia of "stocking" distribution was well marked, but there was no intermittent claudication, though when the patient was seen three years later there was still considerable impairment

of sensation in the limb. When lying in bed and asleep he was then sometimes awakened by cramp in the left leg. This was only when he went to sleep with his legs drawn up, but, although both legs might be drawn up, the cramp occurred only in the leg that had been injured.—I am, etc.,

London, W., March 16th. F. Parkes Weber, M.D.

EUROPEAN v. AMERICAN ETHER.

Sir,—I send you part of an interesting communication on anaesthesia at the front by a well-known American anaesthetist.[1] He voices the difficulty in producing anaesthesia by the open method which I have heard many American *confrères* in this country express. They find that they cannot produce anaesthesia with the ether prepared from methylated spirit, which we use, within a reasonable time and without a good deal of excitement even in patients who have recently had a preliminary dose of morphine and atropine. On the other hand, the late Sir Frederic Hewitt, who was a great advocate of open ether by much the same method as is in use in America, did not, I believe, find any special difficulty, although he used of late years ether produced from methylated spirit. Personally, although I never administer open ether *ab initio*, I have not noticed any difference between British methylated ether and American ether (Squibbs), which is pure ethyl oxide.

Professor Crile, writing on his experiences in an American hospital in Paris before America joined the allies, said that the American anaesthetists found that French soldiers did not take gas and oxygen or ether as well as did patients in the United States. (I presume that in his hospital American ether was used.) He suggested that the difficulty arose because French soldiers were accustomed to take a little alcohol.

These variations in the production of anaesthesia are probably not due to any difference in the method, which is much the same everywhere. They can only be accounted for by the difference (1) in the drug used, (2) in climate, (3) in racial characteristics or mode of life.

I cannot think that European or British methylated ether is so much inferior to the American ether as Lieutenant Guedel believes, and am inclined to attribute his difficulties to the last two factors mentioned. It is impossible to obtain American ether in this country, otherwise it would be of great value if British anaesthetists could administer it and compare results with those of their American *confrères*.—I am, etc.,

Birmingham, March 14th. W. J. McCardie.

PHARYNGEAL HAEMORRHAGE DUE TO LEECHES.

Sir,—This accident was very common in Napoleon's army when retreating from Syria into Egypt. Larrey (*Mémoires*) describes many cases.—I am, etc.,

March 22nd. W. P. Herringham.

[1] First Lieutenant A. E. Guedel, *American Journal of Surgery*, January, 1918.

Obituary.

R. S. TREVOR, M.B., B.C.Cantab.,

LECTURER IN PATHOLOGY, ST. GEORGE'S HOSPITAL.

Robert Salusbury Trevor, a member of a family much connected with Indian military history, was the son of the late Colonel S. T. Trevor, and was born in India on January 22nd, 1872. Together with his twin brother (now Lieut.-Colonel W. H. Trevor, D.S.O.) he spent two years (1885–7) at Marlborough, and then was at "Wren's" with a view to the Indian Civil Service. This course, however, he abandoned, and subsequently went to Clare College, Cambridge, graduating in the Mathematical Tripos in 1894 and proceeding to the M.A. degree in 1898. In the meantime he had joined the medical school of St. George's Hospital, where his life's work was destined to be done. After taking the M.B., B.C. degrees he became curator of the museum and demonstrator of morbid anatomy. The high character of his work ensured his election as lecturer on pathology in the medical school and pathologist to the hospital in 1906, and he thus became entirely responsible for all the routine work entailed by these posts. In addition he was soon appointed pathologist to the Belgrave, Samaritan, General Lying-in, and Grosvenor Hospitals, lecturer on forensic medicine and toxicology in the medical school, and became increasingly in request as an expert in medico-legal work among the coroners of London. He was also for a time warden of the medical school and, from 1911 until his death, dean of the medical school. These multifarious activities may to some extent explain why his literary output was comparatively small, for he had collected much material, especially on the causes of sudden death, such as intracranial aneurysms and the status lymphaticus, and on congenital abnormalities. But the main reason was characteristic of the man—namely, genuine and unobtrusive modesty. Scattered papers on splenic anaemia, the morbid anatomy of the pancreas and other abdominal organs, and on medico-legal subjects, appeared under his name from time to time, but most of them saw the light only because they were conjoint efforts or specially called for, and any suggestion of self-assertion was entirely foreign to his mental attitude. His work was most thorough and methodical, and his wide experience, well enforced by a knowledge of foreign literature, rendered him an authority to whom frequent appeals were made, always met as a matter of course by most unselfish help. His hospital records will long serve as a model to his successors, and to his colleagues in the school and hospital his sad death is an irreparable loss.

Apart from his engrossing professional career, Trevor had other sides: he was a fine singer, a good speaker, was interested in old books, archaeology, and photography, held high rank as a Freemason, and entered fully into the life of the medical school, where he exerted a powerful though unostentatious influence for unity and right living. Charming as a companion, conciliatory as a colleague, and transparently honest, he was firm in what he considered right, and yet it is doubtful if he had any enemies. Of a sensitive nature, though few signs of this were allowed to appear on the surface, he was further handicapped by indifferent health, much aggravated by chronic overwork. Latterly the increased strain due to hospital shortage, and the disturbed nights entailed by his duties as a special constable, no doubt accentuated his long-standing tendency to depression, and thus led to the premature loss of a life characterized by self-sacrifice and devotion to duty.

The funeral took place at Kensal Green Cemetery on March 25th.

We have recently learnt with great regret of the death of Dr. E. J. Edwardes, who was well known to the profession as an authority on the history of vaccination. He was the sixth son of Mr. Thomas Edwardes, F.R.C.S., of Llansantffraid, Montgomeryshire. His mother was an Englishwoman. He received his medical education at St. Mary's Hospital medical school, at which he held a scholarship in natural science in 1871, and in pathology in 1876; before winning the latter he took the diploma of L.S.A. in 1875; he became L.R.C.S.Edin. in 1887, and graduated M.B.Lond. in 1876. After holding the office of house-surgeon to the Western Ophthalmic Hospital, Marylebone Road, he joined his father for a time, but later settled in practice at Llanfyllin, Montgomeryshire, where his practice covered a very large area, and he held many appointments. After a few years he married and settled in London, taking the M.D.Lond. and the M.R.C.P. in 1882. He was at one time assistant physician to the North-West London Hospital, and physician to the Farringdon and to the St. Pancras Dispensaries. He was a man of many interests, a good linguist, and widely read in many subjects. In 1892 he published a remarkable little book entitled *Vaccination and Small-pox*, and ten years later *A Concise History of Small-pox and Vaccination*. In the same year he contributed an article entitled "A Century of Vaccination" to the Jenner Number of the British Medical Journal. He assisted Mrs. Garrett Anderson in the foundation of the Imperial Vaccination League, formed to appeal (which it did with much success) to the general public, and especially to those conducting large retail businesses; after Mrs. Anderson's retirement he became its honorary secretary. Among other subjects with which he occupied himself was the preparation of a book on mathematics, but the chief interest of his later

years, after his retirement from practice, was the preparation of a translation of Dante's poems; a translation of Hell was published about two years ago, and those on Purgatory and Paradise were in course of preparation. His health began to fail early in 1917; he became seriously ill in August, and died on December 11th. He is survived by his widow, by a daughter, and by a son who holds a Government appointment in Burma.

DR. BROOKS H. WELLS of New York, professor of gynaecology for many years at the New York Polyclinic Medical School and Hospital, and editor since 1892 of the *American Journal of Obstetrics and Diseases of Women and Children*, died recently at the age of 58.

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE degree of Doctor of Medicine has been conferred on Eric A. Pearce-Gould, and the degree of M.A. *honoris causâ* upon R. H. Anglin Whitelocke, M.D.Edin.

UNIVERSITY OF CAMBRIDGE.

PARLIAMENTARY REGISTER.

THE Registrary of the University desires to make it known to graduates who are not already on the register as members of the senate, including Bachelors (who became full Bachelors in the December of the year in which they were admitted to their degrees), that they are entitled to be placed on the register of parliamentary electors of the university under the provisions of the Franchise Act of 1918. Forms for making the necessary claim will be sent on application to the Registrary.

UNIVERSITY OF MANCHESTER.

THE following gentlemen have obtained the Diploma of Public Health: G. M. Coope, Isaac Flack, T. E. Flitcroft, J. E. Lezama, H. E. R. Stephens.

UNIVERSITY OF ABERDEEN.

AT the graduation ceremony on March 22nd the following degrees were conferred:

M.D.—F. L. Keith, W. B. Livermore, Major J. Macpherson, A.A.M.C., *W. L. Miller.

M.B., CH.B.—‡ J. D. Brown, I. G. Innes, Winifred M. A. Kindness, Mary J. M. MacLaren, A. Ritchie.

* Commended for thesis. † With second class honours.
‡ Passed fourth professional examination with distinction.

UNIVERSITY OF GLASGOW.

RESEARCH FELLOWSHIPS IN MEDICINE AND APPLIED CHEMISTRY.

UNDER the bequest of the late William Brechin Faulds, Writer in Glasgow, a Research Fellowship in Medicine, of the annual value of about £200, tenable for three years, has been founded in the university. The Fellowship will be awarded, on the recommendation of the Faculty, by the Senatus Academicus to a recent graduate in medicine who has shown capacity for independent inquiry or research. He will devote himself to some branch of work approved by the Senatus, and will not engage in professional practice. He may be authorized or required to pursue his inquiry for one year elsewhere than in the University of Glasgow. The Ferguson Trustees have announced their intention of founding a Research Fellowship in Applied Chemistry, also of the annual value of £200, tenable by a Bachelor of Science of the University. He will be expected to carry out his investigations either at the university or at the affiliated Royal Technical College.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AT the meeting of the Royal College of Physicians of London on March 25th, when Dr. Norman Moore, as is noted elsewhere, was elected President, it was resolved, on the recommendation of the Committee of Management, that, inasmuch as the South African College, Capetown, is to become the university of Capetown on or about April 4th, the courses of instruction in chemistry, physics and biology, anatomy and physiology, hitherto recognized by the Conjoint Board in England when given at the South African College, shall be recognized under the constitution of the new university, and that the examination in chemistry, physics, and biology for the degree of bachelor of science of the university of Capetown shall be accepted in lieu of the first professional examination of the Conjoint Board in England in those subjects. The Western University, London, Ontario, was restored to the list of universities recognized by the Examining Board of England. At the same meeting a gift from Mrs. John Abercrombie of a pair of scales, formerly the property of Dr. Edward Jenner, was accepted.

Medical News.

THE Wellcome Historical Medical Museum will be closed for cleaning from April 1st to 30th inclusive.

ANDREW TAYLOR STILL, the founder of "osteopathy," died recently at the age of nearly 90.

AT a meeting of the College of Ambulance, Vere Street, London, on March 23rd, it was decided to place the institution on a permanent basis, for which purpose a considerable sum of money will be needed. Its founder, Sir James Cantlie, expressed the hope that it would be linked with the University of London, and brought into relation with the new Ministry of Health.

A PAPER on the medical aspects of the food problem will be read by Dr. Robert Hutchison at a meeting of the West London Medico-Chirurgical Society, at the West London Hospital, on Friday, April 5th, at 8.30 p.m.

PROFESSOR ARTHUR KEITH will give at the Royal Institution after Easter a course of five lectures on British anthropologists, and Dr. C. S. Myers two lectures on present-day applications of experimental psychology.

AN entrance Salomons Scholarship of £50 at Epsom College will be vacant at the beginning of the summer term. Applications must be received, addressed to the Secretary of the College, 37, Soho Square, W., by April 6th.

THE annual meeting of the Medical Sickness Annuity and Life Assurance Society will be held at the Holborn Restaurant on Friday, May 3rd, at 4 p.m. Nominations for members of the committee must be received in writing at the society's office, 300, High Holborn, W.C., not later than one month before the date of the meeting.

THE regulations of the University of London with regard to the M.D. (State Medicine) have been amended to recognize laboratory experience at a base hygiene laboratory and experience in charge of a base district on lines of communication of a British expeditionary force. Full particulars can be obtained on application to the Academic Registrar.

THE University of Edinburgh has accepted an invitation to attend a conference summoned by the Foreign Secretary and the Minister of Education to consider, with representatives of other universities, the possibility of establishing closer connexion between British universities and those of the allied countries. The conference is to be held on May 9th.

AT the monthly meeting of the Central Midwives Board on March 21st, the chairman, Sir Francis Champneys, referred with deep regret to the death of Mr. Arthur Henry Williams Ayling, L.S.A., who had represented the Society of Apothecaries, and announced that Mr. Charles Sangster, M.R.C.S., L.S.A., had been appointed his successor. Twenty-nine midwives were removed from the roll on their own application. At the meeting on the previous day four women had been struck off the roll on various charges.

THE Prehistoric Society of East Anglia is an energetic body which now draws members from districts far beyond its borders, and not a few among them are members of the medical profession. Its president last year was Dr. A. E. Peake, who does not reside in East Anglia, but his address described some new excavations of Grime's Graves at Weeting, in Norfolk. Like other papers in the *Proceedings*, and like indeed a great part of the matter on prehistory now being published, it is largely concerned with attempts to date, or rather to find epochs for, the objects unearthed.

AT the annual Court of Governors of the Hospital for Epilepsy and Paralysis, Maida Vale, on March 22nd, the observations made by Mr. Hodge, to which we referred last week (pp. 346, 352), and the letter by Professor Elliot Smith in the *Times* of that day, were discussed. It was pointed out that the Home of Recovery at Golders Green was established as a branch of the hospital at the end of May, 1917, to receive men, on the recommendation of the Ministry of Pensions, who had been invalided from the services suffering from what is commonly known as "shell shock." Two resolutions prepared spontaneously from the patients at present in the Home, numbering 95, and signed by all, had, it was reported, been sent to the Committee. The resolutions stated that all having benefited, and in many cases recovered, they desired to express their contentment and satisfaction with remaining in the institution. Past experience in general hospitals had taught them to appreciate separation from other cases, especially from the so-called "cheery man"; they preferred "to risk the air raid results before that of going to another hospital."

Letters, Notes, and Answers.

The telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

LETTERS, NOTES, ETC.

GONORRHŒA COMPLICATED BY SYPHILIS.

DR. JAMES S. ROBERTSON (London, W.) states that during his term of service as house-surgeon in the London Male Lock Hospital he never saw a case of gonorrhœa in any way aggravated by an intravenous injection of novarsenobillon. In many such cases he observed that joint pains vanished after an injection.

DR. C. F. MARSHALL (London, W.) writes: Captain Lumb attributes gonorrhœal complications, such as epididymitis, prostatitis, etc., arising during treatment with mercury and arsenobenzol in cases of double infection with syphilis and gonorrhœa, to the action of the mercury rather than the arsenobenzol. The evidence in support of this view is not convincing. In the pre-salvarsan days mercurial treatment was more intense than it is now, when it is subsidiary to arsenical treatment, but gonorrhœal complications seldom occurred in patients undergoing mercurial treatment for syphilis; on the contrary, the mercury appeared to have a beneficial effect on the gonorrhœa. A more probable explanation would appear to be that the phenomena observed were due to gonococcal invasion of tissues rendered vulnerable by the hyperaemic action (Herxheimer's reaction) produced by the arsenobenzol.

THE OLDEST ENGLISH HOSPITAL.

MR. A. H. COUGHTREY (Librarian, St. Bartholomew's Hospital and College, London) writes: It comes as rather a shock to many of us to read in your columns that Angers Hospital is claimed to be the oldest English hospital, presumably on the ground that at the time the hospital was founded England possessed that part of France in which it was situated (by-the-by Henry II did homage to Louis). Doubt is suggested that St. Bartholomew's Hospital was really a hospital. *Liber fundacionis ecclesie Sancti Bartholomei Londoniarum* makes it quite clear that sick people, many of them from distant parts of the country, were received in the hospital, though their cures were attributed to miracles at the shrine of the church. There may be a similar objection to the title of St. Bartholomew's Hospital at Rochester on the ground that it was a lazar house. This noted Kentish hospital was founded by Bishop Gundulph in 1078, forty-five years before its namesake in London, as a hospital for lepers.

*** The building erected by Henry II when he founded the Hôpital Saint Jean at Angers in 1170 is now the Archaeological Museum, the larger part of the collection being displayed in the great hall. Over the entrance to the present hospital, built early in last century, is a tablet recording that the hospital was founded by "Henry II Comte d'Anjou et roi d'Angleterre."

"A MEDICAL SECRETARIAT."

A CORRESPONDENT sends us a curious document which he has received by post, and upon which he invites comment in the JOURNAL. It is in the form of a printed letter head "Confidential," enclosed in an envelope marked "Personal"—for which reasons we suppress the author's name. He begins thus: "*Re* a Medical Secretariat. In view of the possibility of a State Medical Service after the war, the proposal outlined herein is being promulgated amongst the Temporary Medical Officers of H.M. Services, in the hope that its adoption will considerably benefit the profession generally and to a large extent nullify the necessity for State intervention." Pompous, perhaps, but whetting to the appetite. He proceeds: "Whilst the medical man's inherent dislike of any form of compulsion or 'unionism' is at once acknowledged, it is submitted that it is of the utmost importance to the medical profession (and not less so as regards the national health) that the young doctors, who will be more or less suddenly thrown upon their own resources after 'demobilization,' should be themselves organized in order to effectively adjust the law of supply and demand regarding medical services. It is therefore proposed to inaugurate a medical secretariat with offices in London and to charge an annual subscription of £1 1s. to cover working expenses, with membership open to all registered doctors, dentists, and medical students." Likely openings for young practitioners are to be investigated, and the usual business of a medical agency transacted on behalf of the members. A system of accountancy is also to be introduced "whereby with absolute secrecy and satisfaction guaranteed, medical men throughout the country would be enabled to have their bookkeeping done for them by the secretariat for an inclusive fee of 5 per cent. on the total amount received on behalf of the member." The scheme, we learn, has been placed before a number of temporary naval surgeons, and the author has been asked to undertake the task of organization, which he is prepared to do if enough support is forthcoming. A form of application for membership is enclosed, and there are three appendices, the first outlining the system of accountancy proposed, the second indicating subsidiary secretarial work which the author is willing to do—such as arranging loans by mortgage and the settlement of business disputes—and the third giving the modest story of the author's career, from which it appears that he is the son of a deceased doctor, that his age is 30, and that he hopes to obtain a "chartered secretary's" diploma next June. Lastly, there is a note that he will shortly place the proposal before the General Medical Council with the idea of obtaining semi-official recognition in view of the national importance of its primary object. In the meantime we gather that this ambitious leaflet is being distributed widespread among temporary surgeons R.N. Stripped of high-sounding phrases, the idea seems to be nothing more than a plan for setting up a medical and dental agency and bookkeeping institution, with side lines in the way of income tax and insurance work and the transaction of business which is usually placed in the hands of a solicitor. All this the originator of the scheme is prepared to take upon his own shoulders, on the strength of eleven years' service in a bank and three years' experience as accountant in the Royal Naval Reserve. Not a word is said about a managing committee, a board of directors, or other controlling body. Without in any way desiring to question the author's good faith, we cannot advise junior members of the profession to rally round this medical secretariat, even though "to give the proposed scheme an unbiassed trial would cost you 21s. only."

CULTIVATION OF DRUG PLANTS.

DR. G. F. SYDENHAM of Dulverton, Somerset, writes to express surprise that the British Medical Association has not made a special effort to encourage the cultivation of native drug plants. The stocks in hand of manufacturing chemists are, he says, being used up. The National Herb Industry, Ltd., of Verulam Street, London, he is informed, last year sold £1,000 worth of herbs to chemists, and in January this year had orders for £12,000 worth. He is honorary local secretary for the enterprise, and believes it to be an honest attempt to meet a national necessity. This country, he considers, can supply a large part of the trade demand; some of the plants grow wild, but others will have to be cultivated. His district is, he says, the home of digitalis and male fern, while hyoscyamus grows wild on the north coast of Somerset. Belladonna is, he states, a profitable herb to grow. Further development and organization are, he considers, necessary to provide the drug plants required.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE following subscriptions to the Fund have been received during the week ending March 25th:

	£	s.	d.		£	s.	d.
Dr. Frank Hinds	2	2	0	Messrs. Parke, Davis and Co.	100	0	0
Dr. G. A. Sutherland ...	3	3	0	Dr. J. W. Papillon ...	1	1	0
Major John Robert Williams, R.A.M.C.T. ...	1	1	0	Mr. G. H. Knowles ...	1	1	0
				Mr. J. R. Phillips... ...	0	10	0

Subscriptions to the Fund should be sent to the Treasurer, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

ERRATA.

Treatment of Shock.

IN a paragraph, on post-operative complications and treatment, of the paper on gunshot wounds of the abdomen by Captain R. Charles (BRITISH MEDICAL JOURNAL, March 23rd, p. 339, col. 2), the sentence with regard to intravenous injections for shock should have stated that the proportion of gum acacia used was 6 per cent., and not 2, as printed.

Prophylaxis of Pneumococcic Infections.

IN the third line from the end of the leading article on prophylaxis of pneumococcic infections (BRITISH MEDICAL JOURNAL, March 23rd, p. 351, col. 2) for "antipneumococcic vaccine" read "antipneumococcic serum."

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.